Ratios

1. Find the ratio of squares to total shapes in the diagram below.

Unsimplified ratio of squares to total shapes:

$\square : \square$

For every 1 square there are _____ total shapes,

therefore the simplified ratio of squares to total shapes is

_____ : _____.

2. Find the ratio of triangles to circles in the diagram below.

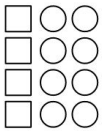
Unsimplified ratio of triangles to circles:

$\square : \square$

For every 1 triangle there are _____ circles, therefore the

simplified ratio of triangles to circles is _____ : _____.

3. Find the ratio of squares to total shapes in the diagram below.



Unsimplified ratio of squares to total shapes:

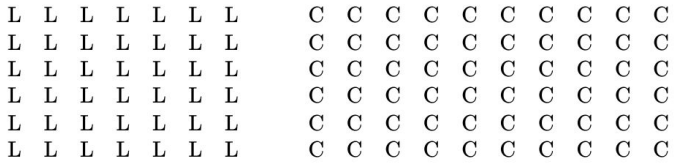
$\square : \square$

For every 1 square there are _____ total shapes,

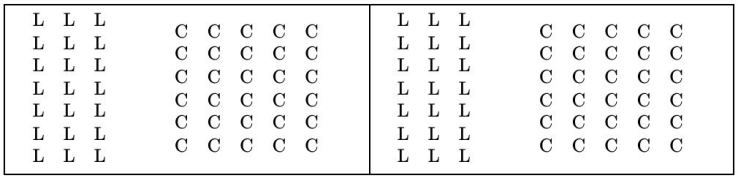
therefore the simplified ratio of squares to total shapes is

_____ : _____.

4. There are 42 lollipops and 60 candy bars for a gift bag. In other words, lollipops and candy bars are in a 42:60 ratio.



These lollipops and candy bars can be put into smaller equal groups. For example, an equivalent ratio of 21:30 can be grouped like this:



Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ lollipops for every _____ candy bars.

Ratios

5. There are 6 apples and 24 bananas for a fruit basket. In other words, apples and bananas are in a 6:24 ratio.

A A A
A A A

B B B B B B
B B B B B B
B B B B B B
B B B B B B

These apples and bananas can be put into smaller equal groups. For example, an equivalent ratio of 3:12 can be grouped like this:

A A A B B B B B B B B B B B B	A A A B B B B B B B B B B B B

Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ apples for every _____ bananas.

6. There are 18 dogs and 42 cats at a pet daycare. In other words, dogs and cats are in a 18:42 ratio.

D D D D D D
D D D D D D
D D D D D D

C C C C C C C
C C C C C C C
C C C C C C C
C C C C C C C
C C C C C C C
C C C C C C C

These dogs and cats can be put into smaller equal groups. For example, an equivalent ratio of 9:21 can be grouped like this:

D D D D D D D D D C C C C C C C C C C C C C C C C C C	D D D D D D D D D C C C C C C C C C C C C C C C C C C

Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ dogs for every _____ cats.

Ratios

7. There are 8 lollipops and 24 candy bars for a gift bag. In other words, lollipops and candy bars are in a 8:24 ratio.

L L L L
L L L L

C C C C C C
C C C C C C
C C C C C C
C C C C C C

These lollipops and candy bars can be put into smaller equal groups. For example, an equivalent ratio of 4:12 can be grouped like this:

L L L L C C C C C C C C C C C C	L L L L C C C C C C C C C C C C

Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ lollipops for every _____ candy bars.

8. There are 48 apples and 40 bananas for a fruit basket. In other words, apples and bananas are in a 48:40 ratio.

A A A A A A A A
A A A A A A A A
A A A A A A A A
A A A A A A A A
A A A A A A A A
A A A A A A A A

B B B B B B B B
B B B B B B B B
B B B B B B B B
B B B B B B B B
B B B B B B B B

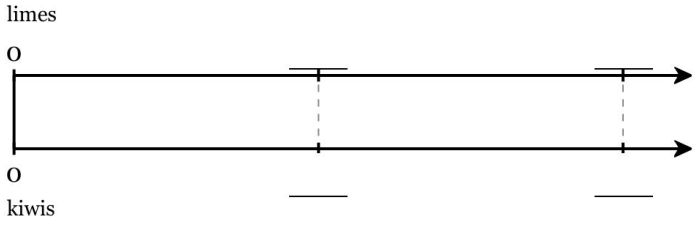
These apples and bananas can be put into smaller equal groups. For example, an equivalent ratio of 24:20 can be grouped like this:

A A A A A A A A A A A A A A A A A A A A A A A A B B B B B B B B B B B B B B B B B B B B	A A A A A A A A A A A A A A A A A A A A A A A A B B B B B B B B B B B B B B B B B B B B

Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ apples for every _____ bananas.

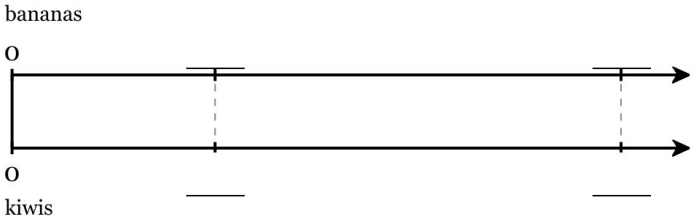
9. Genesis has kiwis and limes in a ratio of 94:20. How many kiwis does she have if she has 10 limes? (a) On the double number line below, fill in the given values, then use multiplication or division to find the missing value. (b) Complete the sentence.



Genesis has _____ kiwis if she has 10 limes.

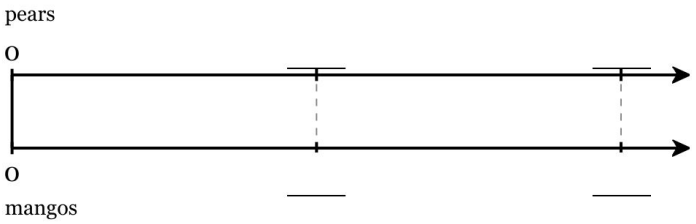
Ratios

10. Wyatt has kiwis and bananas in a ratio of 25:58. How many bananas does he have if he has 75 kiwis? (a) On the double number line below, fill in the given values, then use multiplication or division to find the missing value. (b) Complete the sentence.



Wyatt has _____ bananas if he has 75 kiwis.

11. Evan has mangos and pears in a ratio of 11:76. How many pears does he have if he has 22 mangos? (a) On the double number line below, fill in the given values, then use multiplication or division to find the missing value. (b) Complete the sentence.



Evan has _____ pears if he has 22 mangos.

12. A bookstore sells 6 books for $75. Which table represents the relationship between number of books and the total price?

A

Books	Cost
1	$12.50
2	$13.50
3	$14.50

B

Books	Cost
1	$12.50
11	$22.50
21	$32.50

C

Books	Cost
6	$75
12	$81
18	$87

D

Books	Cost
6	$75
7	$87.50
8	$100

13. Yasmin earns $45.75 for 3 hours of work. If she makes a constant hourly wage, which table represents the relationship between the number of hours she works and her total earnings?

A

Time (hours)	Pay
1	$15.25
2	$16.25
3	$17.25

B

Time (hours)	Pay
3	$45.75
6	$48.75
9	$51.75

C

Time (hours)	Pay
3	$45.75
4	$61
5	$76.25

D

Time (hours)	Pay
1	$15.25
11	$25.25
21	$35.25

Ratios

14. The ratio of students to adults on a field trip is 70 to 7. Which table correctly represents this ratio?

A

Students	Adults
10	1
11	2
12	3

B

Students	Adults
70	7
77	14
84	21

C

Students	Adults
70	7
80	8
90	9

D

Students	Adults
10	1
20	11
30	21

15. A recipe uses 4 cups of milk to make 24 servings. If the same amount of milk is used for each serving, how many servings can be made from three quarts?

$$1 \text{ gallon} = 4 \text{ quarts}$$
$$1 \text{ quart} = 2 \text{ pints}$$
$$1 \text{ pint} = 2 \text{ cups}$$
$$1 \text{ cup} = 8 \text{ fluid ounces}$$

(a) How many **cups** will you need to find the number of servings for?

(b) How many servings can be made from that many cups?

16. Arianys drives 5 miles in 10 minutes. If she drove two hours in total at the same rate, how far did she go?

(a) How many **minutes** did Arianys drive in total?

(b) How many miles would Arianys drive in that many minutes?

17. Alexandra bought two pounds of strawberries for $12.80. What is the price, in dollars per *ounce* of strawberries?

$$1 \text{ pound} = 16 \text{ ounces}$$

(a) How many **ounces** of strawberries did Alexandra buy?

(b) What is the price of strawberries in dollars per ounce?

Ratios

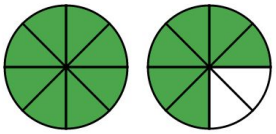
18. A grocery store sells a bag of 3 oranges for $1.92. How much would it cost for 8 oranges?

19. It cost Eva $29.85 to send 199 text messages. How much would it cost to send 179 text messages?

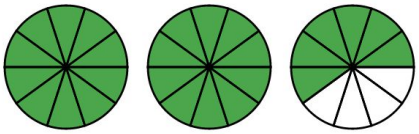
20. Olivia drove 105 miles in 3 hours. If she continued at the same rate, how long would it take to travel 560 miles?

Rational Number Conversions

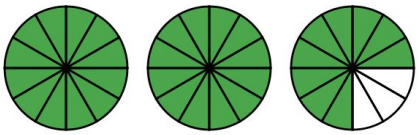
1. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.



2. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.



3. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.



4. Simplify: $\frac{40}{110}$

5. Simplify: $\frac{32}{110}$

6. Simplify: $\frac{12}{48}$

7. Simplify: $\frac{70}{88}$

8. Simplify: $\frac{18}{20}$

9. Round 8.11 to the nearest tenth.

10. Round 2.1486 to the nearest hundredth.

11. Round 3.29 to the nearest whole number.

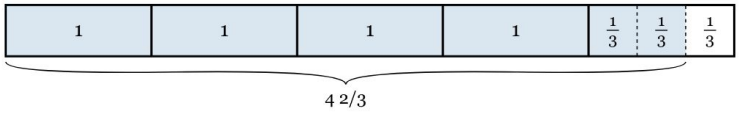
Rational Number Conversions

12. Round 64899.4100117 to the nearest ten.

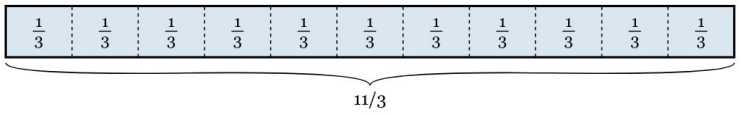
13. Round 531.775197122 to the nearest ten-thousandth.

14. Round 231469.335329 to the nearest thousand.

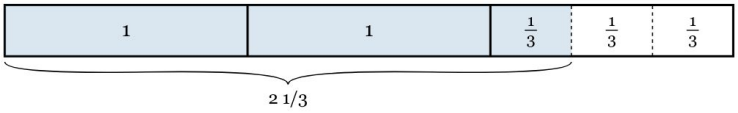
15. Convert $4\frac{2}{3}$ into an improper fraction.



16. Convert $\frac{11}{3}$ into a mixed number.



17. Convert $2\frac{1}{3}$ into an improper fraction.



18. Convert $\frac{35}{6}$ into a mixed number.

19. Convert $7\frac{1}{4}$ into an improper fraction.

20. Convert $6\frac{4}{5}$ into an improper fraction.

21. Convert $\frac{19}{10}$ into a mixed number.

Rational Number Conversions

22. Convert $6\frac{7}{8}$ into an improper fraction.

23. Convert $\frac{9}{50}$ into a decimal.

24. Convert $\frac{11}{12}$ into a decimal.

25. Convert $\frac{19}{50}$ into a decimal.

26. Convert $\frac{13}{20}$ into a decimal.

27. Convert $\frac{11}{50}$ into a decimal.

28. Convert 0.637 to a fraction in simplest form.

29. Convert 0.934 to a fraction in simplest form.

30. Convert 0.263 to a fraction in simplest form.

31. Convert 0.676 to a fraction in simplest form.

32. Convert 0.255 to a fraction in simplest form.

Rational Number Conversions

33. Convert $.\overline{28}$ to a fraction in simplest form.

34. Convert $.2\overline{7}$ to a fraction in simplest form.

35. Convert $.\overline{5}$ to a fraction in simplest form.

36. Convert $.4\overline{7}$ to a fraction in simplest form.

37. Convert $.\overline{03}$ to a fraction in simplest form.

Rational Number Operations

1. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{3}{4} + \frac{7}{32}$$

2. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{11}{17} - \frac{1}{17}$$

3. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{11}{8} + \frac{8}{3}$$

4. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{7}{16} - \frac{11}{20}$$

5. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{1}{10} + \frac{7}{10}$$

6. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{7}{10} + \left(-\frac{5}{6}\right)$$

7. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{5}{12} - \left(-\frac{9}{11}\right)$$

8. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{7}{17} + \left(-\frac{12}{17}\right)$$

9. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{1}{6}+\frac{4}{9}$$

10. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{5}{12}-\left(-\frac{9}{11}\right)$$

11. Perform the operation below. Express your answer as a mixed number in simplest form.

$$4\frac{3}{10}-2\frac{7}{9}$$

12. Perform the operation below. Express your answer as a mixed number in simplest form.

$$4\frac{5}{8}+1\frac{3}{5}$$

13. Perform the operation below. Express your answer as a mixed number in simplest form.

$$3\frac{1}{10}+2\frac{2}{5}$$

14. Perform the operation below. Express your answer as a mixed number in simplest form.

$$4\frac{1}{6}+1\frac{2}{5}$$

15. Perform the operation below. Express your answer as a mixed number in simplest form.

$$3\frac{1}{2}+4\frac{3}{8}$$

16. Perform the operation below. Express your answer as a mixed number in simplest form.

$$3\frac{1}{2}-\left(-1\frac{9}{10}\right)$$

Rational Number Operations

17. Perform the operation below. Express your answer as a mixed number in simplest form.

$$3\frac{2}{3} - 1\frac{3}{5}$$

18. Perform the operation below. Express your answer as a mixed number in simplest form.

$$-4\frac{7}{8} - \left(-1\frac{1}{2}\right)$$

19. Perform the operation below. Express your answer as a mixed number in simplest form.

$$-3\frac{3}{5} + 2\frac{1}{4}$$

20. Perform the operation below. Express your answer as a mixed number in simplest form.

$$-3\frac{1}{2} - 1\frac{3}{4}$$

21. Perform the operation and simplify the answer fully.

$$\frac{1}{8} \cdot \frac{3}{4}$$

22. Perform the operation and simplify the answer fully.

$$\frac{6}{7} \cdot \frac{5}{3}$$

23. Perform the operation and simplify the answer fully.

$$\frac{\frac{3}{2}}{\frac{5}{6}}$$

24. Perform the operation and simplify the answer fully.

$$\frac{\frac{1}{2}}{\frac{5}{9}}$$

25. Perform the operation and simplify the answer fully.

$$\frac{1}{4} \cdot \frac{7}{2}$$

26. Perform the operation and reduce the answer fully. Make sure to express your answer as a simplified fraction.

$$\frac{1}{2} \cdot \frac{3}{5}$$

27. Perform the operation and reduce the answer fully. Make sure to express your answer as a simplified fraction.

$$\frac{-\frac{5}{7}}{\frac{5}{8}}$$

28. Perform the operation and reduce the answer fully. Make sure to express your answer as a simplified fraction.

$$-\frac{7}{8} \cdot \frac{10}{7}$$

29. Enter the missing values in the area model to find: $6 \cdot 9\frac{4}{5}$. Express your final answer as a mixed number or a whole number.

In the model below, express values as whole numbers, improper fractions, or mixed numbers. To enter a mixed number in the model, use a space and the slash key. For example: 3 1/2.

	9	4/5
6	_____	_____

According to the model above, $6 \cdot 9\frac{4}{5} =$ _____

30. Enter the missing values in the area model to find: $20\frac{1}{2} \div 4$. Express your final answer as a mixed number or a whole number.

In the model below, express values as whole numbers, improper fractions, or mixed numbers. To enter a mixed number in the model, use a space and the slash key. For example: 3 1/2.

	____	____
4	20	1/2

According to the model above, $20\frac{1}{2} \div 4 =$ _____

31. Enter the missing values in the area model to find: $48\frac{1}{4} \div 6$. Express your final answer as a mixed number or a whole number.

In the model below, express values as whole numbers, improper fractions, or mixed numbers. To enter a mixed number in the model, use a space and the slash key. For example: 3 1/2.

	____	____
6	48	1/4

According to the model above, $48\frac{1}{4} \div 6 =$ _____

Rational Number Operations

32. Evaluate the expression shown below and write your answer as a mixed number in simplest form.

$$-4\frac{9}{10} \div \frac{9}{10}$$

33. Evaluate the expression shown below and write your answer as a mixed number in simplest form.

$$-1\frac{1}{2} \times 3\frac{5}{6}$$

34. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{1}{5} \div -\frac{2}{7}$$

35. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{5}{7} \cdot \frac{7}{9}$$

36. Evaluate the expression shown below and write your answer as a mixed number in simplest form.

$$-5\frac{6}{7} \times \frac{9}{10}$$

37. Perform the operation and simplify the answer fully.

$$\frac{\frac{9}{8} + \frac{1}{12}}{\frac{1}{3}}$$

38. Perform the operation and simplify the answer fully.

$$\frac{\frac{4}{7}}{-\frac{1}{2}}$$

Rational Number Operations

39. Perform the operation and simplify the answer fully.

$$\frac{\frac{1}{2}}{\frac{5}{6}+\frac{1}{10}}$$

40. Perform the operation and simplify the answer fully.

$$\frac{\frac{1}{6}}{-3}$$

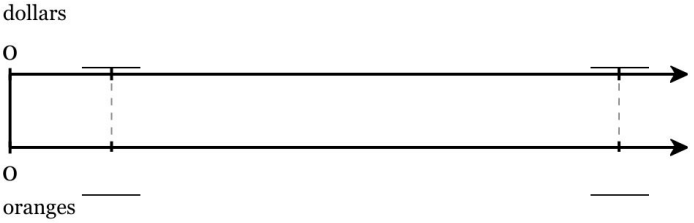
41. Perform the operation and simplify the answer fully.

$$\frac{\frac{10}{7}}{9}$$

Unit Rates / Reasoning

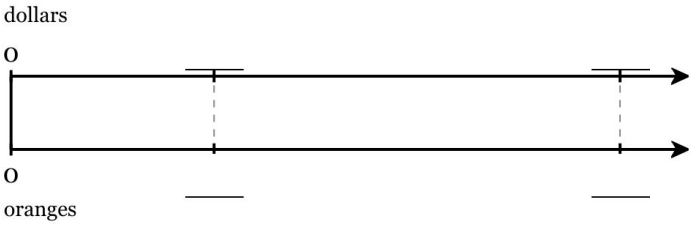
1. It cost Josiah $0.27 to send 3 text messages. How much does each text cost to send?

2. A grocery store sells a bag of 6 oranges for $2.58. What is the cost of oranges, in dollars per orange? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.

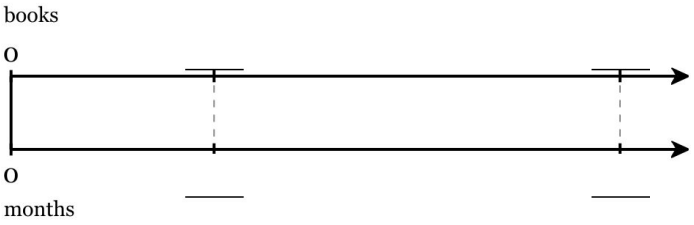


3. Jace earned $81.00 at his job when he worked for 5 hours. What did he earn in one hour?

4. A grocery store sells a bag of 3 oranges for $1.17. What is the unit cost? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.



5. Genesis read 9 books in 3 months. If she reads at a constant rate, how many books did she read each month? Give your answer as a whole number or a FRACTION in simplest form. On the double number line below, fill in the given values, then use multiplication or division to find the missing value.



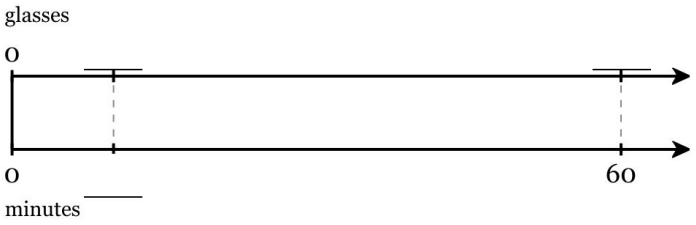
6. Ellie drove 270 miles in 6 hours. On average, how fast did she drive, in miles per hour?

Unit Rates / Reasoning

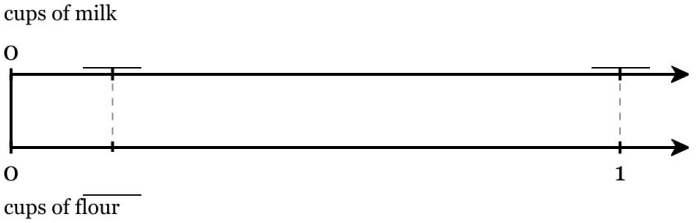
7. Isaiah earned $237.00 at his job when he worked for 10 hours. How much money did he earn each hour?

8. Jose earned $488.00 at his job when he worked for 20 hours. How much money did he earn each hour?

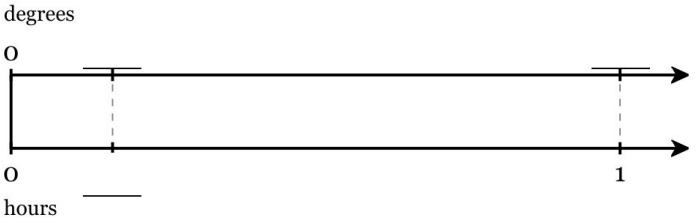
9. On average, Avani drinks $\frac{2}{7}$ of a 10-ounce glass of water in 15 minutes. How many glasses of water does she drink in one hour? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.



10. A recipe requires $2\frac{3}{4}$ cups of milk for every $\frac{1}{4}$ of a cup of flour. How many cups of milk are required for each cup of flour? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.



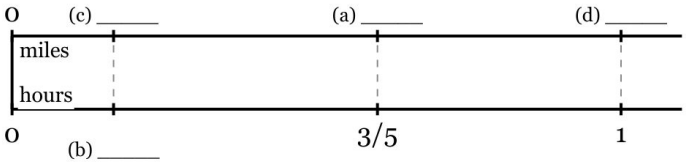
11. Amira conducted a scientific experiment. For a certain time, the temperature of a compound rose $3\frac{4}{5}$ degrees in $\frac{1}{5}$ of an hour. What was the rate, in degrees per hour, that the temperature of the compound rose? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.



Unit Rates / Reasoning

12. Jayden drove 21 miles in $\frac{3}{5}$ hours. On average, how fast did he drive, in miles per hour?

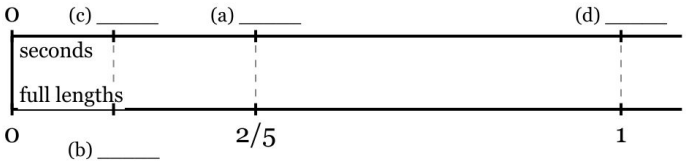
First, reason down from $\frac{3}{5}$ to $\frac{1}{5}$. Fill in (a), (b), and (c) on the double number line below. Use fractions (proper or improper) or whole numbers.
Then, reason up from the unit fraction and fill in (d).



Answer: _____ miles per hour

13. Julian observes a marble travel along a horizontal path at a constant rate. The marble travels $\frac{2}{5}$ of the length of the path in 30 seconds. At that rate, how many seconds does it take the object to travel the full length?

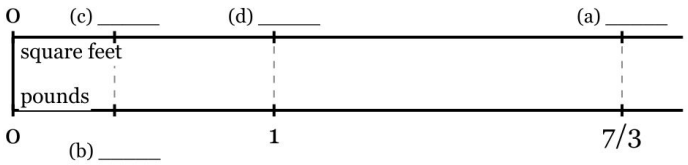
First, reason down from $\frac{2}{5}$ to $\frac{1}{5}$. Fill in (a), (b), and (c) on the double number line below. Use fractions (proper or improper) or whole numbers.
Then, reason up from the unit fraction and fill in (d).



Answer: _____ seconds

14. The label on a $2\frac{1}{3}$-pound bag of seeds states that it will cover an area of 455 square feet. What is the area that one pound of seeds will cover?

First, reason down from $2\frac{1}{3}$ to $\frac{1}{3}$. Fill in (a), (b), and (c) on the double number line below. Use fractions (proper or improper) or whole numbers.
Then, reason up from the unit fraction and fill in (d).



Answer: _____ square feet

15. Meena was driving down a road and after 4 hours she had traveled 98 miles. At this speed, how many miles could Meena travel in 10 hours? Fill out the table of equivalent ratios until you have found the value of x.

Miles	Hours
98	4

After driving for 10 hours, Meena traveled _____ miles.

Unit Rates / Reasoning

16. For a given recipe, 2 cups of flour are mixed with 14 cups of sugar. How many cups of sugar should be used if 22 cups of flour are used? Assuming a constant ratio, fill out the table of equivalent ratios until you have found the value of x.

Flour	Sugar
2	14

_____ cups of sugar should be mixed with 22 cups of flour.

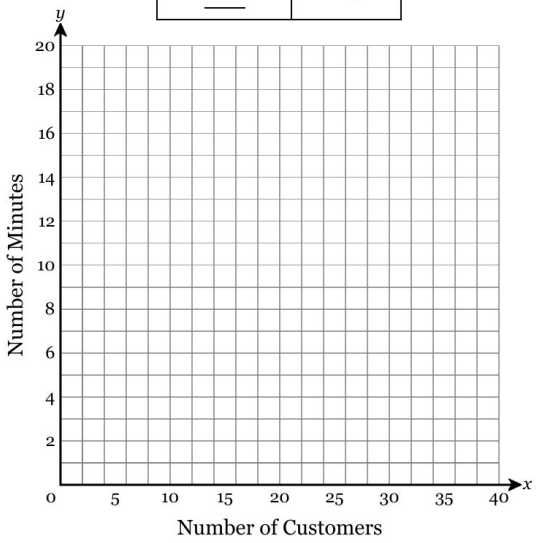
17. At a local print shop, 10 copies can be made for $4. At this rate, how many copies could be made for $36? Fill out the table of equivalent ratios until you have found the value of x.

Copies	Dollars
10	4

It would cost $36 to make _____ copies.

18. 10 customers entered a store over the course of 6 minutes. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

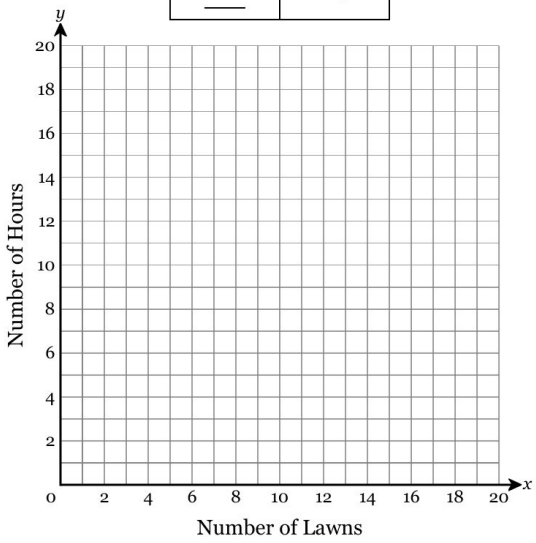
Customers	Minutes
5	___
10	6
___	15



Unit Rates / Reasoning

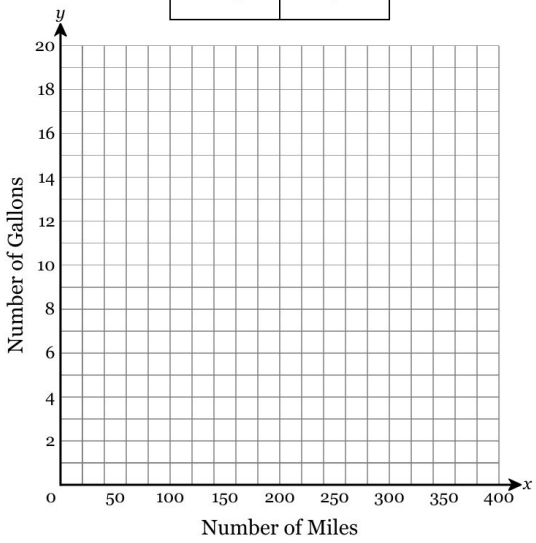
19. Feng mowed 6 lawns in 9 hours. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

Lawns	Hours
2	___
6	9
___	18



20. Connor's car used 7 gallons of gas to drive 210 miles. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

Miles	Gallons
___	1
180	___
210	7



Proportional Relationships

1. The table below shows Ayden's earnings on the job.

Time (hours)	Earnings (dollars)
11	$377.30
23	$788.90
35	$1200.50

What is the constant of proportionality between earnings and time in hours?

2. Ariana buys 10 bottles of grapefruit juice at the corner store for a total cost of $11.80. If each bottle costs the same amount, how much is each bottle of juice?

3. A company orders 15 boxed lunches from a deli for $128.25. If each boxed lunch costs the same amount, what is the unit cost of each boxed lunch?

4. The length of a cell phone is 1.6 inches and the width is 3.6 inches. The company making the cell phone wants to make a new version whose length will be 1.2 inches. Assuming the side lengths in the new phone are proportional to the old phone, what will be the width of the new phone?

5. A $7\frac{1}{2}$-inch candle burns down in 10 hours. After how many hours will it have burned $6\frac{3}{8}$ inches?

6. At the neighborhood grocery, 2.5 pounds of salmon cost $\$21.35$. Dianelys spent $\$12.81$ on salmon. How many pounds of salmon did she buy, to the nearest hundredth of a pound?

7. The table below shows Makayla's earnings on the job.

Time (hours)	Earnings (dollars)
15	$387
21	$541.80
27	$696.60

How much does she make in 13.5 hours?

8. The table below lists the masses and volumes of several pieces of the same type of metal. There is a proportional relationship between the mass and the volume of the pieces of metal.

Volume (cubic centimeters)	Mass (grams)
5.1	23.052
9.7	43.844
11.7	52.884

Determine the volume, in cubic centimeters, of a piece of metal that has a mass of 62.828 grams. Round your answer to the nearest tenth.

9. Julian was comparing the price of ground beef at two stores. The equation $y = 7.38x$ represents the total cost, in dollars and cents, y, that it costs for x pounds of ground beef at SuperGrocery A. The table below represents the total cost, in dollars and cents, y, that it costs for x pounds of ground beef at SuperGrocery B.

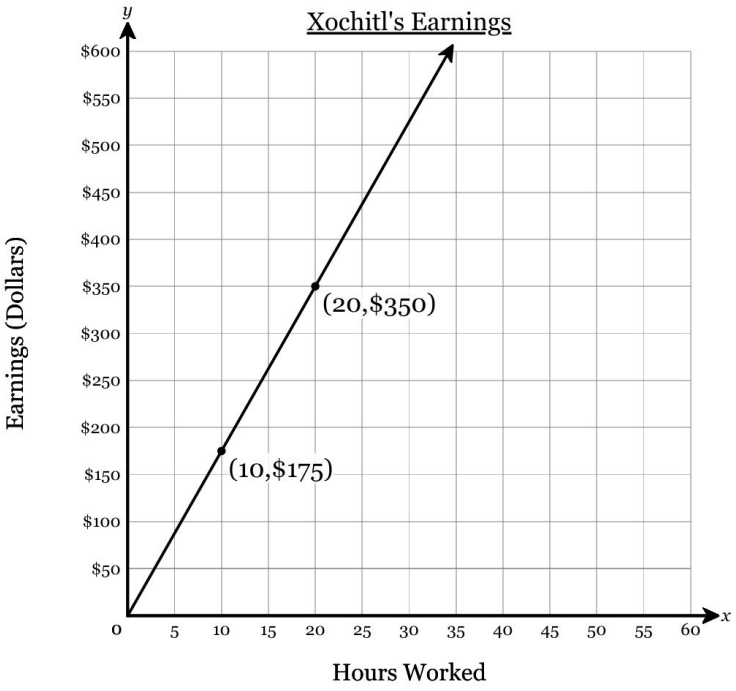
SuperGrocery B

Pounds (x)	Total Cost (y)
2	$18.72
2.5	$23.40
3.5	$32.76
4.5	$42.12

How much more expensive is it, per pound, to buy ground beef at Store B than at Store A?

Proportional Relationships

10. Two friends, Nicole and Xochitl, took summer jobs. Nicole earned \$424.80 in 18 hours. The graph below represents Xochitl's earnings in dollars and cents, y, for working x hours.



How much more does Nicole earn per hour than Xochitl?

11. Scientists are preparing two satellites to be launched. The equation $y = 3000x$ represents the number of miles, y, that the satellite, Space Explorer A, flies in x hours. The table below represents the number of miles, y, that the satellite, Space Explorer B, flies in x hours.

Space Explorer B

Hours (x)	Miles (y)
10	22000
19	41800
21	46200
25	55000

How much faster does Space Explorer A travel per hour than Space Explorer B?

12. Given the speeds of each runner below, determine who runs the fastest.

Emily runs 12 feet per second.

Will runs 510 feet in 46 seconds.

Stephanie runs 1 mile in 404 seconds.

Ron runs 874 feet in 1 minute.

A. Emily B. Will

C. Stephanie D. Ron

Proportional Relationships

13. Given the speeds of each runner below, determine who runs the fastest.

Noah runs 11 feet per second.

Jessica runs 625 feet in 42 seconds.

Zach runs 1 mile in 424 seconds.

Jake runs 644 feet in 1 minute.

A. Noah B. Jessica

C. Zach D. Jake

14. Given the speeds of each runner below, determine who runs the fastest.

Frank runs 11 feet per second.

Emily runs 86 feet in 10 seconds.

Adam runs 1 mile in 388 seconds.

Noah runs 600 feet in 1 minute.

A. Frank B. Emily

C. Adam D. Noah

15. Given the speeds of each runner below, determine who runs the fastest.

Stephanie runs 9 feet per second.

Ron runs 255 feet in 22 seconds.

Liz runs 1 mile in 362 seconds.

Emily runs 605 feet in 1 minute.

A. Stephanie B. Ron

C. Liz D. Emily

16. Given the speeds of each runner below, determine who runs the fastest.

Stephanie runs 8 feet per second.

Zach runs 485 feet in 47 seconds.

Liz runs 1 mile in 540 seconds.

Adam runs 676 feet in 1 minute.

A. Stephanie B. Zach

C. Liz D. Adam

Proportional Relationships

17. Scarlett practices the piano the same number of minutes each day. The relationship between the number of days, x, and the total number of minutes she practices, y, is represented by a graph drawn in the xy-plane.

If the point $(2, 50)$ lies on the graph, what does the ordered pair $(2, 50)$ indicate?

A. Scarlett practices 50 minutes a day for 2 days

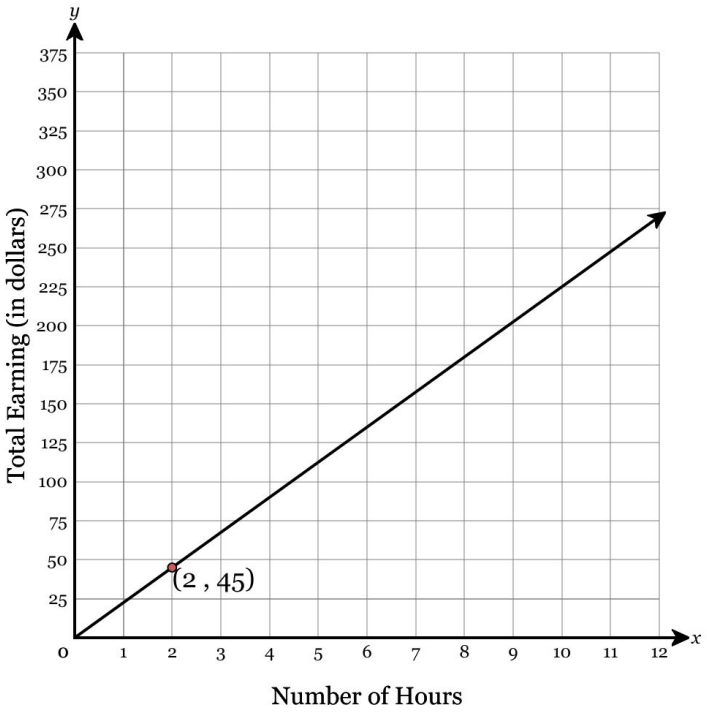
B. Scarlett practices a total of 50 minutes over 2 days

C. Scarlett practices a total of 2 minutes over 50 days

D. Scarlett practices 2 minutes a day for 50 days

18. Nayeli has just gotten a new job. The relationship between the number of hours she works, x, and her total earnings, y, is represented by the graph below.

What does the ordered pair $(2, 45)$ indicate?



A. Nayeli earns \$45.00 per hour for 2 hours

B. Nayeli earns a total of \$2.00 over 45 hours

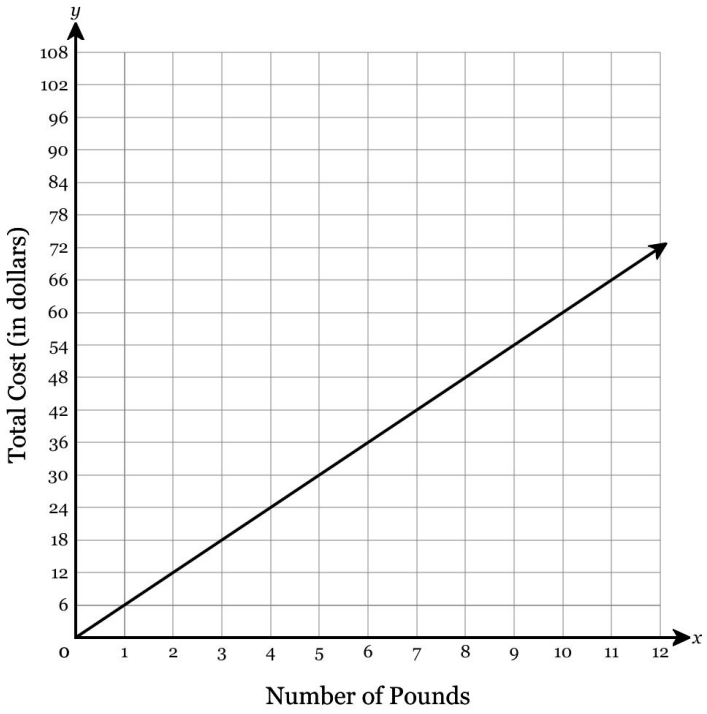
C. Nayeli earns a total of \$45.00 over 2 hours

D. Nayeli earns \$2.00 per hour for 45 hours

Proportional Relationships

19. A grocery store sells sliced turkey by weight. The relationship between the amount of turkey in pounds, x, and the total cost in dollars of the sliced turkey, y, is represented by the graph below.

What point on the graph represents the unit rate?

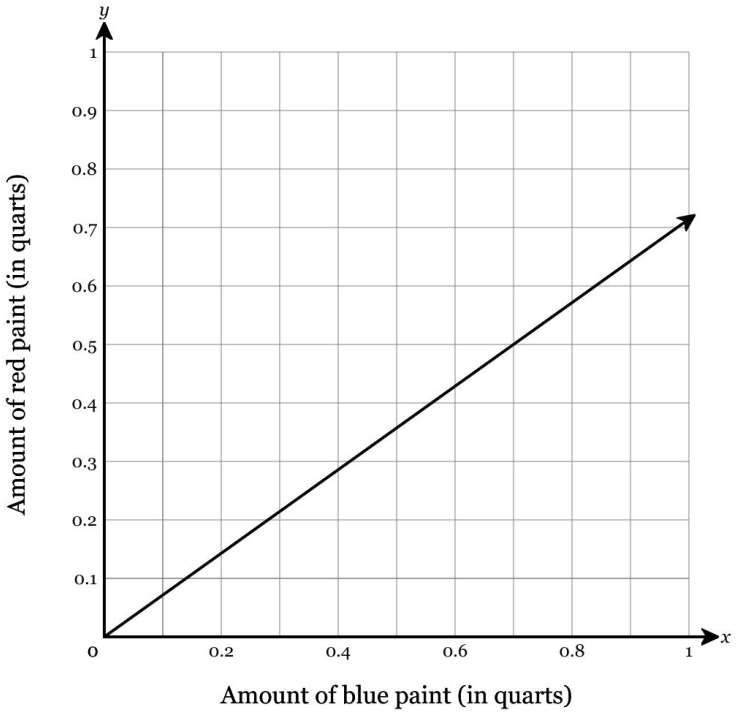


A. $(0\ ,\ 0)$ B. $(1\ ,\ 6)$

C. $(6\ ,\ 1)$ D. $(6\ ,\ 36)$

20. A certain shade of purple paint is made by mixing blue and red paint. The relationship between the number of quarts of blue paint in the mix, x, and the number of quarts of red paint, y, is represented by the graph below.

What is the constant of proportionality as shown in the graph?

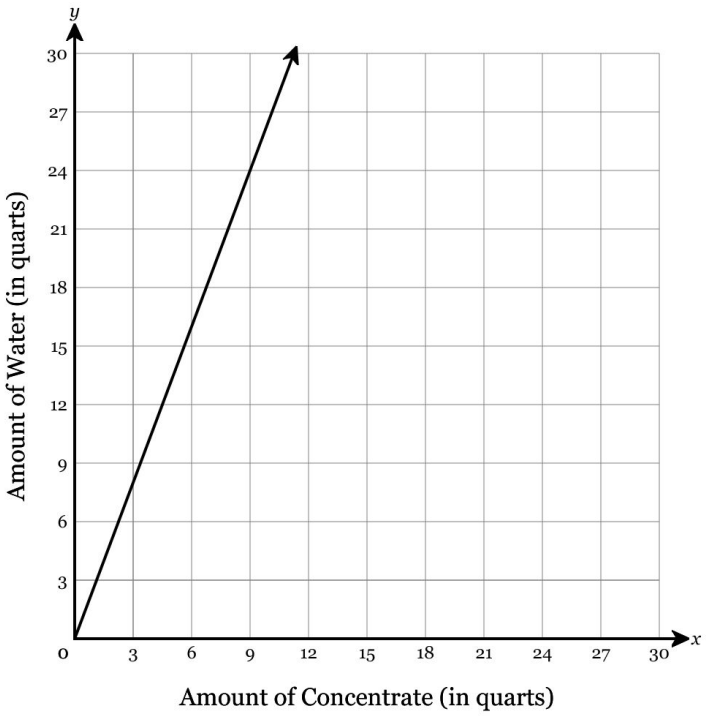


A. $\frac{1}{5}$ B. $\frac{5}{7}$ C. $\frac{5}{12}$ D. $\frac{7}{12}$

Proportional Relationships

21. Isaac is making lemonade from concentrate. The relationship between the number of quarts of concentrate, x, and the number of quarts of water, y, is represented by the graph below.

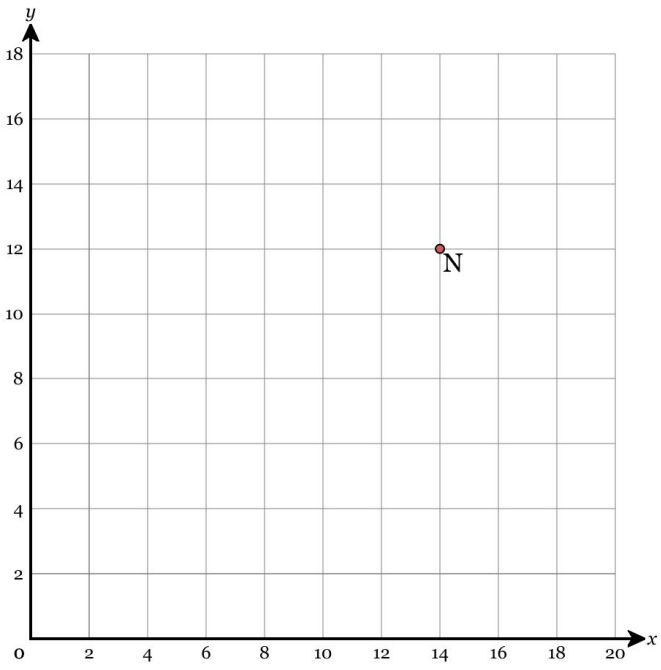
What is the constant of proportionality as shown in the graph?



A. $\frac{1}{3}$ B. $\frac{8}{3}$ C. $\frac{3}{11}$ D. $\frac{8}{11}$

22. Line NM represents a proportional relationship. Point N lies at $(14, 12)$ as shown on the graph below.

Which ordered pair could represent the coordinates of point M?

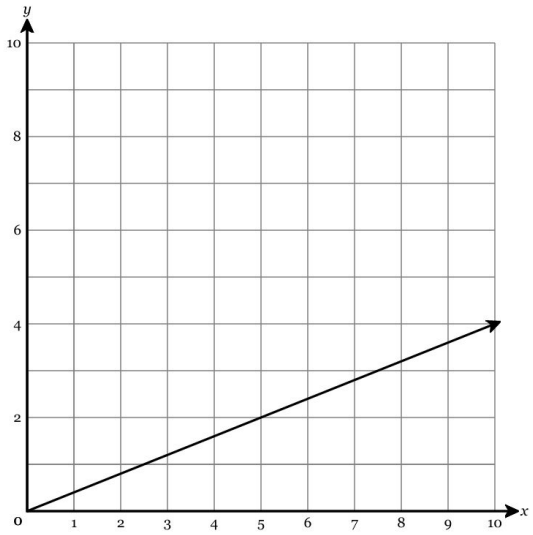


A. $(17.5\,,\,15)$ B. $(0.9\,,0)$

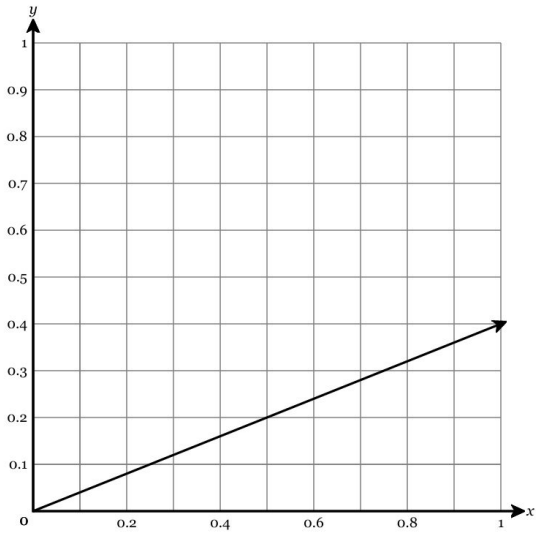
C. $(15\,,\,17.5)$ D. $(2,0)$

Proportional Relationships

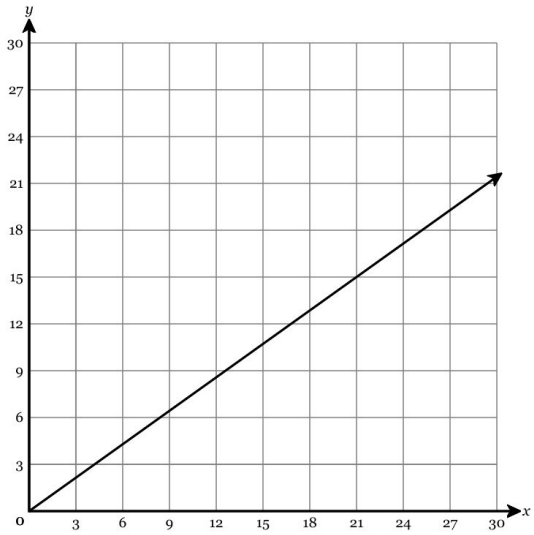
23. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



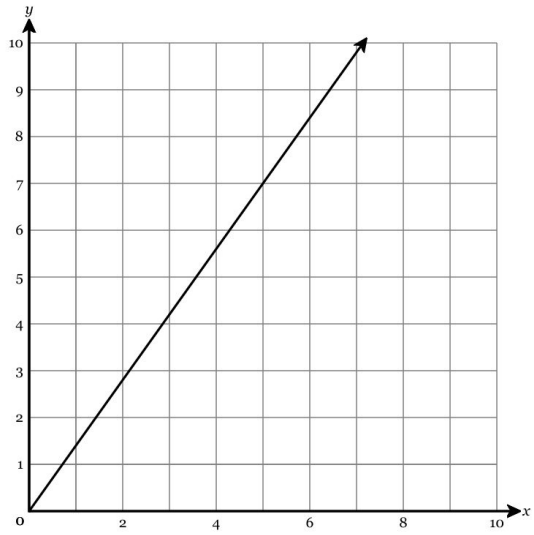
24. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



25. Find the equation that represents the proportional relationship in this graph, for y in terms of x.

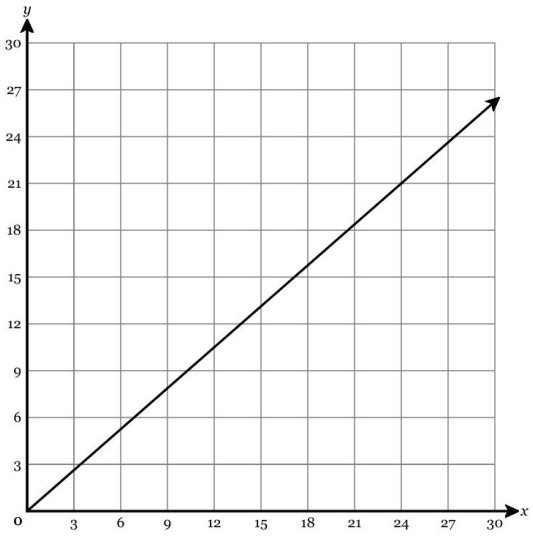


26. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



Proportional Relationships

27. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



28. The table below shows that the number of miles driven by Lillian is directly proportional to the number of gallons she used.

Gallons Used	Miles Driven
29	539.4
47	874.2
50	930

If *m* represents the number of miles driven for any number of gallons used, *g*, write a proportional equation for *m* in terms of *g* that matches the context.

29. The proportional relationship between the number of sweaters a clothing store buys and sells, *s*, and the profit, in dollars and cents, that it makes off those sweaters, can be represented by the equation $p = 21s$. What is the profit in dollars and cents that the store makes per sweater?

30. The table below shows a proportional relationship between g and h.

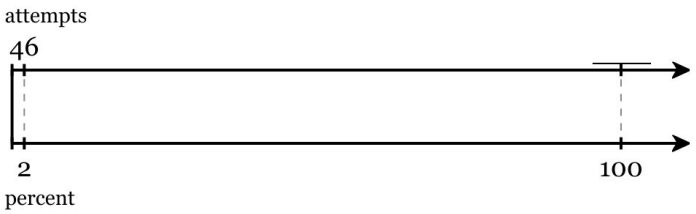
g	h
96	12
144	18
160	20

Write a proportional equation for *h* in terms of *g*. Use a whole number or **fraction**, not a decimal, in your equation.

Using Percent

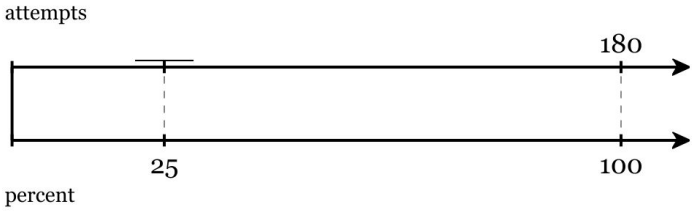
1. Cai misses 2% of the free throws he attempts in a season. How many total free throws did he attempt if he missed 46?

Multiply/scale up to solve.



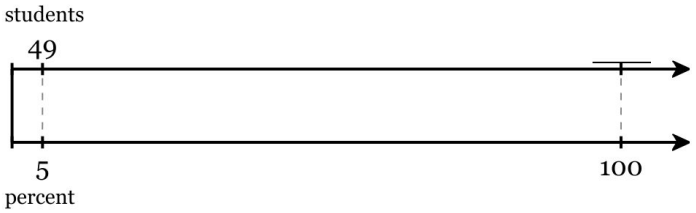
2. Taub made 25% of her free throws over the season. If she shot 180 free throws, how many did she make?

Divide/scale down to solve for the missing percent.

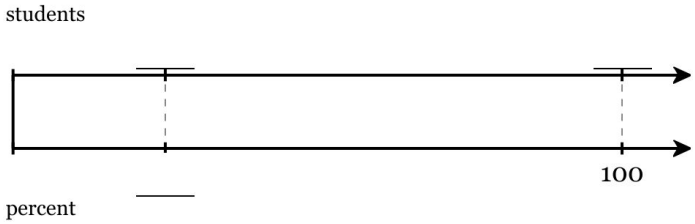


3. All students in Ridgewood Junior High School either get their lunch in the school cafeteria or brought it from home on Tuesday. 5% of students brought their lunch. 49 students brought their lunch. How many students in total are in Ridgewood Junior High School?

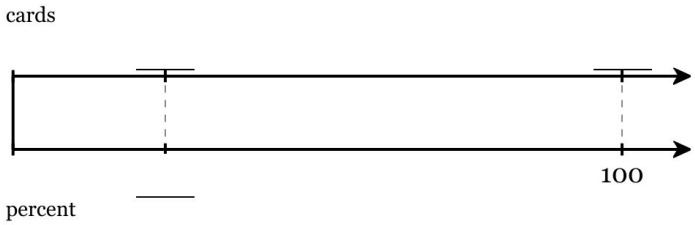
Multiply/scale up to solve.



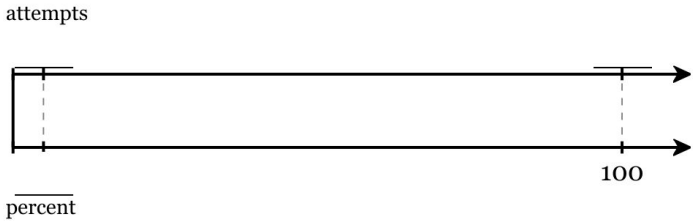
4. There are 160 students in the seventh grade, and 25% are in the Environmental Club. How many students are in the Environmental Club? On the double number line below, fill in the values given in the problem then scale up or down to find the missing value.



5. Bob's gift shop sold a record number of cards for Mother's Day. One salesman sold 50 cards, which was 25% of the cards sold for Mother's Day. How many cards were sold for Mother's Day? On the double number line below, fill in the values given in the problem then scale up or down to find the missing value.



6. Nolan misses 5% of the free throws he attempts in a season. How many total free throws did he attempt if he missed 42? On the double number line below, fill in the values given in the problem then scale up or down to find the missing value.



Using Percent

7. At a football stadium, 20% of the fans in attendance were teenagers. If there were 20 teenagers at the football stadium, what was the total number of people at the stadium?

8. 400 students attend Ridgewood Junior High School. 4% of students bring their lunch to school everyday. How many students brought their lunch to school on Thursday?

9. All students in Ridgewood Junior High School either got their lunch in the school cafeteria or brought it from home on Tuesday. 25% of students brought their lunch. 37 students brought their lunch. How many students in total are in Ridgewood Junior High School?

10. What is 15% of 660?

11. 504 is what percent of 600?

12. 429 is what percent of 650?

13. 71.2 is what percent of 128? Round to the nearest hundredth.

14. Find 112.1% of 186. Round to the nearest tenth.

15. Find 129.9% of 414. Round to the nearest hundredth.

Using Percent

16. A bakery sold a total of 60 cupcakes in a day, and 55% of them were mocha flavored. How many of the cupcakes sold that day were mocha flavored?

17. At a baseball game, 39% of people attending were supporting the home team, while 61% were supporting the visiting team. If 1053 people attending the game supported the home team, what was the total number of people attending the game?

18. Jordan has a mask collection of 360 masks. He keeps 162 of the masks on his wall. What percentage of Jordan's mask collection does he keep on his wall?

19. Josue has a loyalty card good for a 18% discount at his local pharmacy. What number should he multiply the prices on the tags by to find the price he would have to pay, before tax, in one step?

20. Skylar went shopping for a new phone. Sales tax where she lives is 10%. What number should she multiply the price of the phone by to find the total plus tax in one step?

21. Gabriella invests money in an account paying a simple interest of 3% per year. If no money will be added or removed from the investment, what should she multiply her current balance by to find her total balance in a year in one step?

22. Arianys has a loyalty card good for a discount at her local grocery store. To find the total she has to pay, before tax, she multiplies the prices by 0.93. What percent discount does the card give?

23. The population of a city decreases by 1.9% per year. What should we multiply the current population by to find next year's population in one step?

Using Percent

24. The population of a city increases by 1.4% per year. What should we multiply the current population by to find the next year's population in one step?

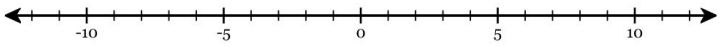
25. Tyler has a loyalty card good for a discount at his local pharmacy. The item he wants to buy is priced at $8, before discount and tax. After the discount, and before tax, the price is $6.88. Find the percent discount.

26. One year, the population of a city was 92,000. Several years later it was 105,800. Find the percent increase.

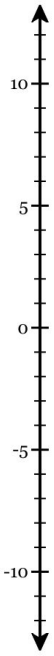
27. Xavier went shopping for a new camera. The listed price of the camera was $38, but the price with tax came to $39.14. Find the percent sales tax.

Signed Numbers

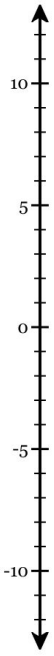
1. Point B is located at 12. Plot Point B on the number line below.



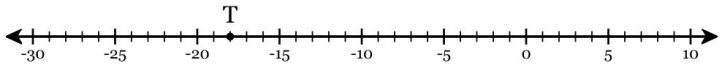
2. Point Y is located at 8. Plot Point Y on the number line below.



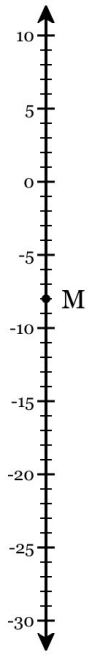
3. Point K is located at -9. Plot Point K on the number line below.



4. Point T is located at -18. Point U is 4 greater than point T. (a) Plot point U on the number line below.
(b) State where U is located.

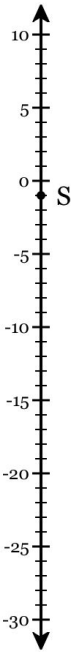


5. Point M is located at -8. Points N and O are each 6 units away from point M. (a) Plot point N and point O on the number line below. (b) State where N and O are located.



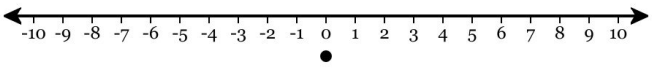
Signed Numbers

6. Point S is located at -1. Point T is 3 greater than point S. (a) Plot point T on the number line below. (b) State where T is located.



7. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

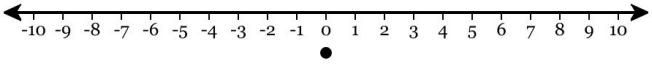
$$4 + 5$$



$4 + 5 =$ ____

8. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

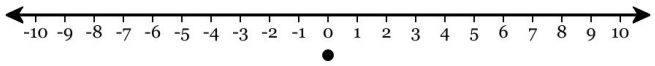
$$6 - 4$$



$6 - 4 =$ ____

9. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

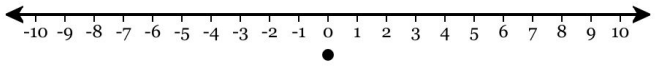
$$-4 + 4$$



$-4 + 4 =$ ____

10. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

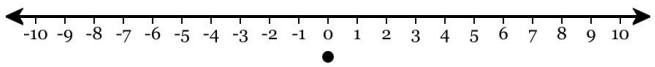
$$-8 - 2$$



$-8 - 2 =$ ____

11. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

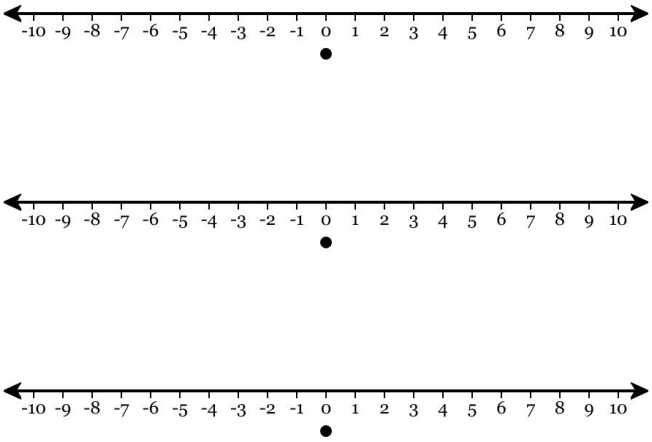
$$-3 + 8$$



$-3 + 8 =$ ____

12. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

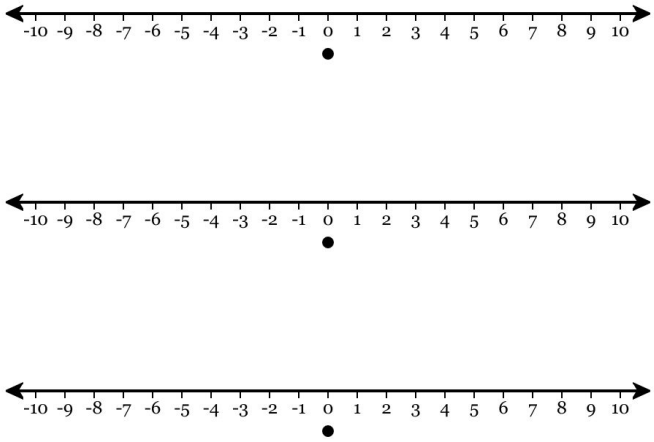
$$-7+5+3$$



What final answer do all of these three diagrams give?

13. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$7-6-2$$

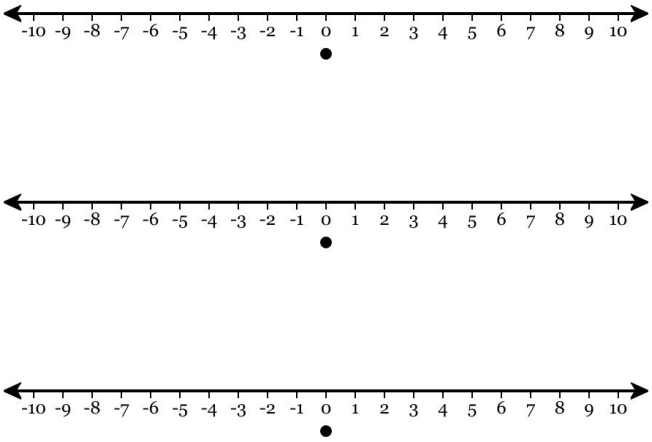


What final answer do all of these three diagrams give?

Signed Numbers

14. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

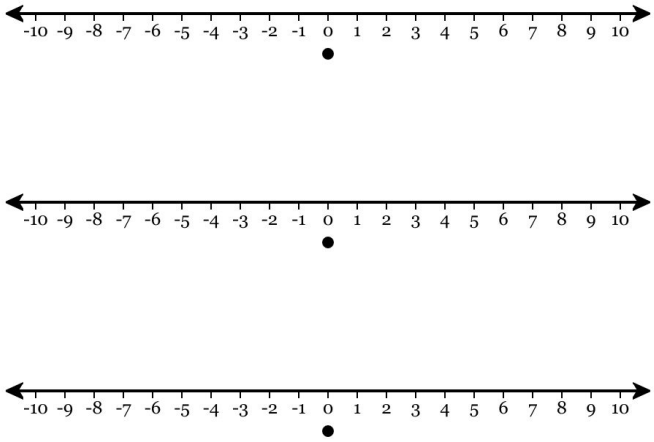
$$-4-2+8$$



What final answer do all of these three diagrams give?

15. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$3+6-2$$

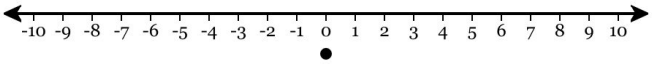


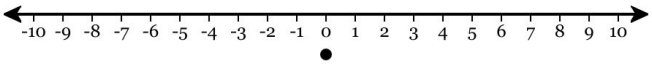
What final answer do all of these three diagrams give?

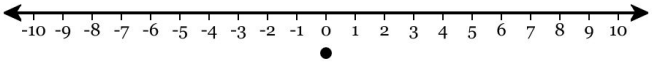
Signed Numbers

16. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

$$6 + 3 - 2$$







What final answer do all of these three diagrams give?

17. Write the numbers below in order from least to greatest. Use commas to separate.

19 -2 -20 -6 -15 -14

18. Write the numbers below in order from least to greatest. Use commas to separate.

-16 -18 17 -9 6 -12

19. Write the numbers below in order from least to greatest. Use commas to separate.

-19 3 -3 11 -18 7

20. Write the numbers below in order from least to greatest. Use commas to separate.

-5.6 -16 -11.2 13.1 -15.6 -5.2

21. Write the numbers below in order from least to greatest. Use commas to separate.

-4.7 -0.8 -0.4 4.8 -12.8 -19.4

22. Write the numbers below in order from least to greatest. Use commas to separate.

-5.4 4.4 -7.8 -15.2 -14.8 -3.5

23. Write the numbers below in order from least to greatest. Use commas to separate.

0.65 -1.96 -1.47 -1.2 -1.71 0.68

Signed Numbers

24. Write the numbers below in order from least to greatest. Use commas to separate.

-0.63	1.55	0.9	-0.19	-0.01	-0.66

25. Write the numbers below in order from least to greatest. Use commas to separate.

1.57	-1.9	0.87	-1.93	-1.15	1.11

26. Which expression is equivalent to $-38.3 - 95.2$?

A. $-95.2 - (-38.3)$

B. $95.2 - (-38.3)$

C. $-38.3 - (-95.2)$

D. $-38.3 + (-95.2)$

27. Which expression has the same value as $10\frac{1}{5} + 7\frac{2}{3}$?

A. $10\frac{1}{5} - (-7\frac{2}{3})$ B. $7\frac{2}{3} + (-10\frac{1}{5})$

C. $10\frac{1}{5} - 7\frac{2}{3}$ D. $-7\frac{2}{3} - 10\frac{1}{5}$

28. Which expression has the same value as $-2x - 5y$?

A. $-2x + (-5y)$ B. $2x + (-5y)$

C. $5y - (-2x)$ D. $-5y - (-2x)$

29. Which expression is equivalent to $-5 + (-7)$?

A. $7 - (-5)$ B. $-7 - (-5)$

C. $-7 + 5$ D. $-5 - 7$

30. Which expression is equivalent to $-3 - 6$?

A. $-6 + 3$ B. $6 - (-3)$

C. $-6 - (-3)$ D. $-3 + (-6)$

31. Which expression is equivalent to $-3.2 + (-80.3)$?

A. $-80.3 - (-3.2)$ B. $3.2 - (-80.3)$

C. $-80.3 - 3.2$ D. $80.3 + (-3.2)$

32. Which expression is equivalent to $-8 - 10$?

A. $-10 + 8$ B. $8 + (-10)$

C. $-10 + (-8)$ D. $-10 - (-8)$

33. Which expression is equivalent to $-1\frac{1}{5} - (-7\frac{3}{4})$?

A. $7\frac{3}{4} + 1\frac{1}{5}$ B. $-1\frac{1}{5} + 7\frac{3}{4}$

C. $7\frac{3}{4} - (-1\frac{1}{5})$ D. $1\frac{1}{5} + 7\frac{3}{4}$

34. Which expression has the same value as $10 + (-4)$?

A. $10 - 4$ B. $-4 + (-10)$

C. $4 - 10$ D. $10 - (-4)$

35. Which expression has the same value as $-6y + (-6x)$?

A. $-6x - (-6y)$ B. $-6x - 6y$

C. $-6y - (-6x)$ D. $-6y + 6x$

Algebraic Expressions

1. What is the value of the expression $5y - 7$ when $y = 9$?

2. What is the value of the expression $8z^2 - 10z - 6$ when $z = 3$?

3. What is the value of the expression $5x - 4y$ when $x = 8$ and $y = 5$?

4. Combine like terms.

$$5y - 5y^2 - 5 + 2 + 2y + 3y^2 - 1$$

5. Combine like terms.

$$5x^2 + 4 + 6y - 1 + 3y - 4x^2 - 5$$

6. Combine like terms.

$$6x^3 + 5y^3 + 4 + y^3 + 6 + x^3 - 3x^3$$

7. Which expression is equivalent to $-6 + h - 9h$?

A. $-14h$ B. $-5 - 9h$

C. $-16h$ D. $-8h - 6$

8. Which expression is equivalent to $-3a + 1 - 9a - 10$?

A. -21 B. $-21a$

C. $-12a - 9$ D. $-2a - 19$

9. The width of a rectangle measures $(6d + 9)$ centimeters, and its length measures $(5d - 8)$ centimeters. Which expression represents the perimeter, in centimeters, of the rectangle?

A. $2 + 22d$ B. $15d - 3$

C. $30d - 6$ D. $11d + 1$

10. Which expression is equivalent to $9r + r - r$?

A. $9r$ B. $1 + 8r$

C. $-11r$ D. $r + 8$

11. The width of a rectangle measures $(6m + 2n)$ centimeters, and its length measures $(9m - 9n)$ centimeters. Which expression represents the perimeter, in centimeters, of the rectangle?

A. $30m + 2 - 18n$ B. $30m - 14$

C. $30m - 14n$ D. $15m - 7$

12. A triangle has side lengths of $(3.1s + 2.5t)$ centimeters, $(4.6s + 5.2u)$ centimeters, and $(8.4u - 8.9t)$ centimeters. Which expression represents the perimeter, in centimeters, of the triangle?

A. $7.7s - 6.4t + 13.6u$

B. $16.1su - 1.2tu$

C. $-0.5u + 7.7s + 7.7t$

D. $5.6st + 9.8su - 0.5tu$

13. The width of a rectangle measures $(4.2m - 1.2n)$ centimeters, and its length measures $(8.4m - 5.5n)$ centimeters. Which expression represents the perimeter, in centimeters, of the rectangle?

A. $25.2m - 11n - 1.2$ B. $-13.4 + 25.2m$

C. $-13.4n + 25.2m$ D. $-6.7 + 12.6m$

14. Which expression is equivalent to $0.32t + t - 0.53$?

A. $0.79t$ B. $1.32t - 0.53$

C. $-1.21t$ D. $0.32t + 0.47$

15. Which expression is equivalent to $0.83v + v - 0.69v$?

A. $1.14v$ B. $-0.52v$

C. $1 + 0.14v$ D. $v + 0.14$

16. Which expression is equivalent to $4.3w + 4.2 + 2.9w - 1.7$?

A. $1.4w + 2.5$ B. $2.5 + 7.2w$

C. $1.4w + 5.9$ D. $8.5w + 1.2$

17. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$-(-0.9m + 5n) - 2$$

18. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$-(-7w + 2.4x - 6)$$

19. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$-(-8.7x - 9)$$

20. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$0.6f - (-2g + 1)$$

21. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$-(-6p - 9.2q - 2.3)$$

22. Use the distributive property to write an equivalent expression.

$$4(v + 2w)$$

23. Use the distributive property to write an equivalent expression.

$$5(6x + 3y - 6)$$

24. Use the distributive property to write an equivalent expression.

$$7(6s - 7t + 4)$$

25. Use the distributive property to write an equivalent expression.

$$8(8p + 10)$$

26. Use the distributive property to write an equivalent expression.

$$3(s - 10t + 1)$$

27. Rewrite in simplest terms: $8(-6f - 8) + 5f$

Algebraic Expressions

28. Rewrite in simplest terms:
$-9(4n-3)-3(-n-8)$

29. Rewrite in simplest terms: $-6a-8(2a-1)$

30. Rewrite in simplest terms:
$-5(-7r-8r-3)-9r$

31. Rewrite in simplest terms:
$-10(-10g+3h)-9h-2(-10h-10g)$

32. Which expression is equivalent to the expression below?

$$5(6v+6)-7v$$

A. $37v+6$ B. $5(6v+6-7v)$

C. $18v+11$ D. $23v+30$

33. Which expression is equivalent to the expression below?

$$f+f+f+f+f+f+f+g+g+g$$

A. f^7g^3 B. $10fg$

C. $\frac{f}{7}+\frac{g}{3}$ D. $7f+3g$

34. Which expression is equivalent to the expression below?

$$w+w+w+w+w$$

A. $5w$ B. 5 C. $\frac{w}{5}$ D. w^5

35. Which pair of expressions below are equivalent?

A. $6r+3r$ and $9r^2$

B. $6(3r-8)$ and $18r-48$

C. $6r-3s$ and $3s-6r$

D. $6(3r-8)$ and $18r-8$

Algebraic Expressions

36. Which expression is equivalent to the expression below?

$$6(7t) + 3t$$

A. $25t$

B. $42t + 7t^2$

C. $10t + 6$

D. $45t$

Solving Equations

1. Find the value of x in the equation below.

$$30 = 3x$$

2. Find the value of x in the equation below.

$$17 = x + 1$$

3. Find the value of x in the equation below.

$$7 = x - 9$$

4. Find the value of x in the equation below.

$$8 = \frac{x}{8}$$

5. Find the value of x in the equation below.

$$2 = \frac{x}{5}$$

6. Find the value of x in the equation below.

$$x - 15.3 = 8.1$$

7. Find the value of x in the equation below.

$$2x = 12.8$$

8. Find the value of x in the equation below.

$$2.9 = \frac{x}{5}$$

9. Find the value of x in the equation below.

$$13 = x + 10.2$$

10. Find the value of x in the equation below.

$$x + 1 = 5.5$$

11. Solve for a.

$$a - 6 = -9$$

12. Solve for c.

$$4 = c + 10$$

Solving Equations

13. Solve for y.

$$-2 = -10 + y$$

14. Solve for t.

$$8 + t = 7$$

15. Solve for n.

$$7 = n - 2$$

16. Solve for y.

$$-60 = 12y$$

17. Solve for s.

$$48 = 8s$$

18. Solve for t.

$$60 = 12t$$

19. Solve for n.

$$30 = -10n$$

20. Solve for s.

$$-20 = 10s$$

21. Solve for n.

$$-3 = \frac{n}{-8}$$

22. Solve for s.

$$8 = \frac{s}{7}$$

23. Solve for s.

$$\frac{s}{-8} = -5$$

24. Solve for r.

$$9 = \frac{r}{-7}$$

Solving Equations

25. Solve for b.

$$\frac{b}{-8} = -2$$

26. Solve for n and simplify your answer.

$$-\frac{5}{3}n = -10$$

27. Solve for s and simplify your answer.

$$-3 = \frac{5}{2}s$$

28. Solve for r and simplify your answer.

$$10 = -\frac{6}{5}r$$

29. Solve for w and simplify your answer.

$$-\frac{3}{2}w = 7$$

30. Solve for w and simplify your answer.

$$\frac{4}{3}w = -8$$

31. Solve for c.

$$8 = -3c + 29$$

32. Solve for b.

$$14 - \frac{b}{8} = 17$$

33. Solve for a.

$$-56 = 5a - 11$$

Solving Equations

34. Solve for b.

$$7b + 2 = 23$$

35. Solve for b.

$$6b - 11 = -23$$

36. Solve for a.

$$-\frac{a}{0.2} + 0.7 = 17.2$$

37. Solve for b.

$$1.5 - 0.8b = -1.38$$

38. Solve for a.

$$-3.64 = -0.7 - 2.1a$$

39. Solve for a.

$$0.4a + 0.4 = -0.92$$

40. Solve for z.

$$-10.35 = -2.6 + \frac{z}{0.4}$$

41. Solve for z.

$$1 + \frac{1}{7}z = 6$$

Solving Equations

42. Solve for c.

$$6 = -15 + \frac{3}{7}c$$

43. Solve for b.

$$16 = 12 + \frac{1}{5}b$$

44. Solve for b.

$$39 = 15 + \frac{1}{2}b$$

45. Solve for z.

$$53 = -\frac{4}{7}z + 17$$

46. Solve. $3(2x - 1) = 3$

47. Solve. $3(5x - 7) = 9$

48. Solve. $3(2y - 7) = 9$

49. Solve. $2(2x + 8) = 24$

Solving Equations

50. Solve. $5(y+3)=25$

51. Which equation has the solution $x=6$?

A. $6x+3=30$ B. $2x+9=39$

C. $5x-8=22$ D. $6x+6=-42$

52. What value of x makes the equation below true?

$$2x+7=13$$

A. 3 B. 7 C. 10 D. 16

53. Which equation has the solution $x=8$?

A. $9x+9=81$ B. $5x-3=41$

C. $5x+2=67$ D. $8x+1=-65$

54. What value of z makes the equation below true?

$$9z-1=53$$

A. 1 B. 2 C. 6 D. 10

55. What value of w makes the equation below true?

$$4w-4=8$$

A. 1 B. 3 C. 4 D. 15

Equations in Context

1. Under her cell phone plan, Skylar pays a flat cost of $50 per month and $3 per gigabyte. She wants to keep her bill at $60.20 per month. How many gigabytes of data can she use while staying within her budget?

2. Dianelys has a points card for a movie theater.

- She receives 25 rewards points just for signing up.
- She earns 10.5 points for each visit to the movie theater.
- She needs 88 points for a free movie ticket.

How many visits must Dianelys make to earn a free movie ticket?

3. Adam buys cheese and onions at the store.

- He pays a total of $37.96.
- He pays a total of $5.06 for the cheese.
- He buys 5 bags of onions that each cost the same amount.

How much does each bag of onions cost?

4. Paisley wants to ride her bicycle 23.5 miles this week. She has already ridden 7 miles. If she rides for 5 more days, what is the average number of miles she would have to ride each day to meet her goal?

5. Members of a soccer team raised $1673.50 to go to a tournament. They rented a bus for $869.50 and budgeted $50.25 per player for meals. Determine the number of players the team can bring to the tournament.

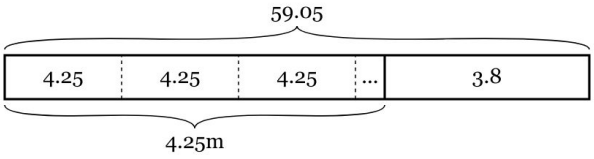
Equations in Context

6. Jacob took a taxi from his house to the airport. The taxi company charged a pick-up fee of $3.80 plus $4.25 per mile. The total fare was $63.30, not including the tip. Which equation or tape diagram could be used to represent the context if m represents the number of miles in the taxi ride?

A

$$3.8m + 4.25 = 63.3$$

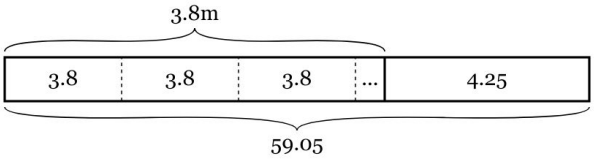
B



C

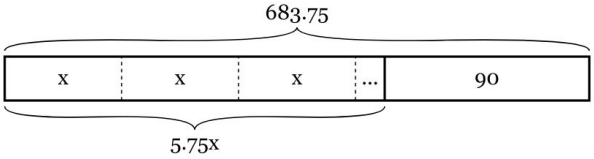
$$4.25m = 63.3 - 3.8$$

D

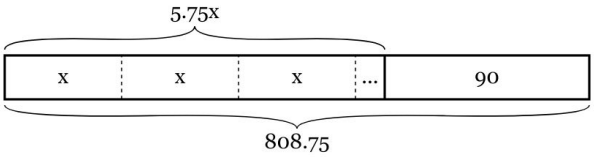


7. Sadie needed to get her computer fixed. She took it to the repair store. The technician at the store worked on the computer for 5.75 hours and charged her $90 for parts. The total was $808.75. Which equation or tape diagram could be used to represent the context if x represents the cost of labor per hour?

A



B



C

$$x = \frac{808.75 - 5.75}{90}$$

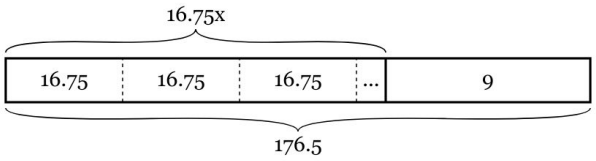
D

$$808.75 = 90x + 5.75$$

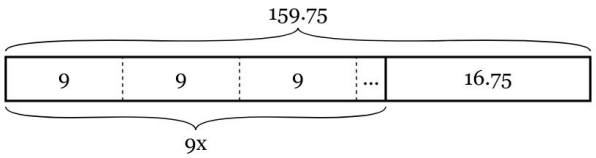
Equations in Context

8. A group of friends wants to go to the amusement park. They have \$176.50 to spend on parking and admission. Parking is \$9, and tickets cost \$16.75 per person, including tax. Which tape diagram could be used to represent the context if x represents the number of people who can go to the amusement park?

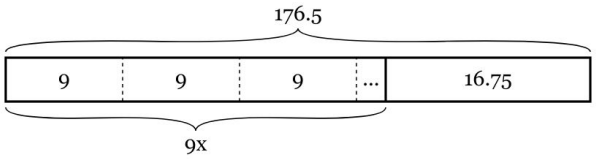
A



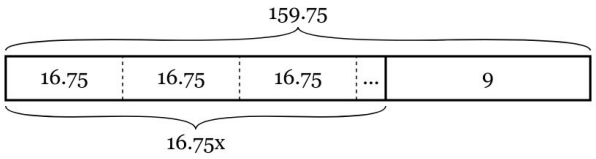
B



C



D



9. Connor buys cheese and potatoes at the store.

- He pays a total of \$31.30.
- He pays \$2.68 for the cheese.
- He buys 6 bags of potatoes that each cost the same amount.

Which equation could be used to determine x, how much each bag of potatoes costs?

A. $x = \frac{2.68 - 31.3}{6}$

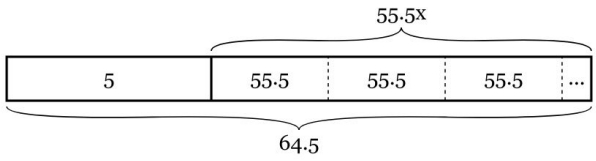
B. $31.3 = 6(x + 2.68)$

C. $6x + 2.68 = 31.3$

D. $x = \frac{31.3 - 6}{2.68}$

10. Under his cell phone plan, Ayden pays a flat cost of \$55.50 per month and \$5 per gigabyte. He wants to keep his bill at \$69.50 per month. Which equation or tape diagram could be used to represent the context if x represents the number of gigabytes of data Ayden can use while staying within his budget?

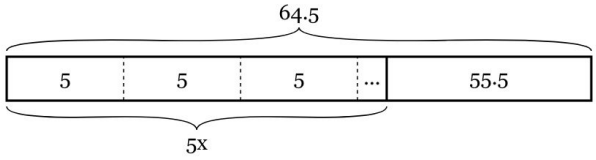
A



B

$$5x + 55.5 = 69.5$$

C

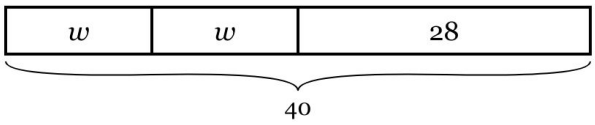


D

$$5(55.5 + x) = 69.5$$

Equations in Context

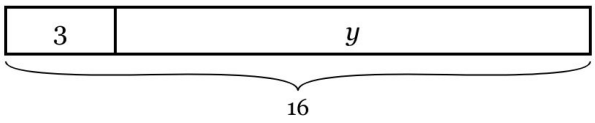
11. Which of the following equations corresponds to the diagram below?



A. $40 \div 28 = w$ B. $2w + 28 = 40$

C. $28 + w = 40$ D. $40 \div 28 = 2w$

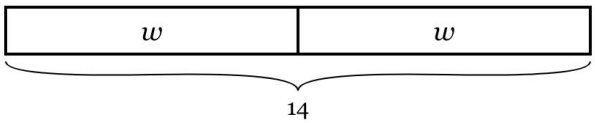
12. Which of the following equations corresponds to the diagram below?



A. $3y = 16$ B. $16y = 3$

C. $y + 16 = 3$ D. $3 + y = 16$

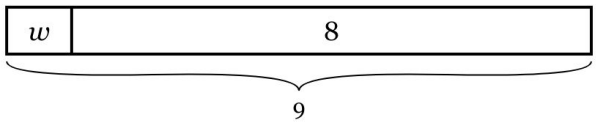
13. Which of the following equations corresponds to the diagram below?



A. $2 - w = 14$ B. $w + w = 14$

C. $w \div 2 = 14$ D. $2 \div w = 14$

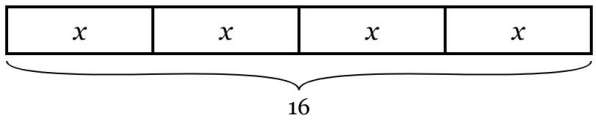
14. Which of the following equations corresponds to the diagram below?



A. $9w = 8$ B. $8 + w = 9$

C. $w - 8 = 9$ D. $8w = 9$

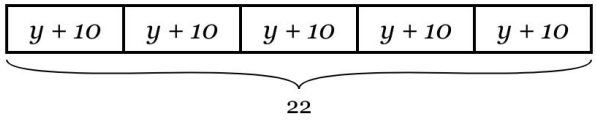
15. Which of the following equations corresponds to the diagram below?



A. $4x = 16$ B. $4 + 16x = 20$

C. $4 \div x = 16$ D. $16x = 4$

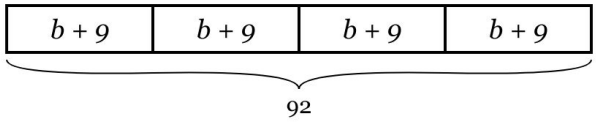
16. Which of the following equations corresponds to the diagram?



A. $10 + 5y = 22$ B. $22(y + 10) = 5$

C. $22 = y + 10$ D. $5(y + 10) = 22$

17. Which of the following equations corresponds to the diagram?

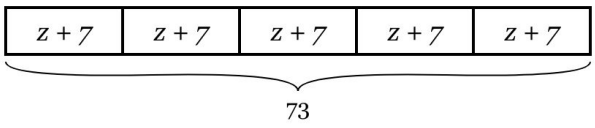


A. $b + 36 = 92$ B. $92 = 36b$

C. $92b + 9 = 4$ D. $23 = b + 9$

Equations in Context

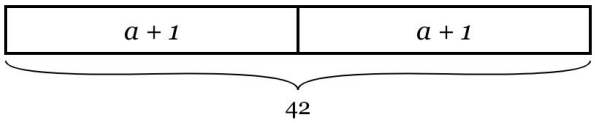
18. Which of the following equations corresponds to the diagram?



A. $73 = 5(z + 7)$ B. $73z = 7$

C. $73(z + 7) = 5$ D. $73z + 7 = 5$

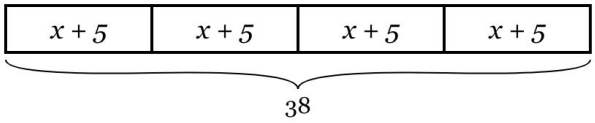
19. Which of the following equations corresponds to the diagram?



A. $a + 1 = 42$ B. $a + 2 = 42$

C. $42 = 2a + 2$ D. $1 + 2a = 42$

20. Which of the following equations corresponds to the diagram?



A. $4 = 5 + 38x$ B. $38 = 4(x + 5)$

C. $5 = 38x$ D. $38(x + 5) = 4$

21. Camila bought snacks for her team's practice. She bought a bag of chips for $3.04 and a 15-pack of juice bottles. The total cost before tax was $31.54. Write and solve an equation which can be used to determine j, how much each bottle of juice cost.

22. Arun buys cheese and oranges at the store.

- He pays a total of $47.94.
- He pays a total of $5.03 for the cheese.
- He buys 7 bags of oranges that each cost the same amount.

Write and solve an equation which can be used to determine x, how much each bag of oranges costs.

23. Members of a baseball team raised $2007.50 to go to a tournament. They rented a bus for $1191.50 and budgeted $68 per player for meals. Write and solve an equation which can be used to determine x, the number of players the team can bring to the tournament.

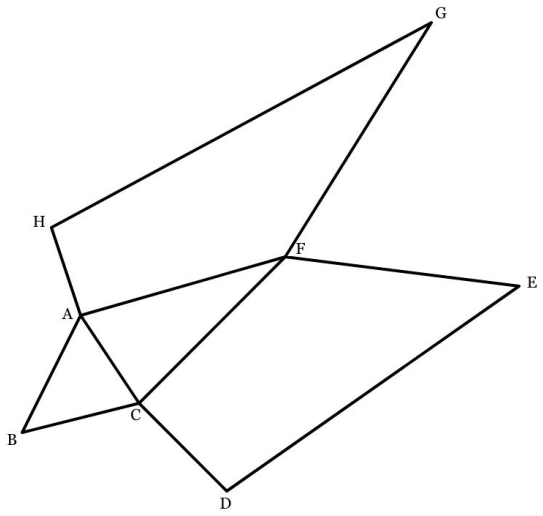
24. Amelia took a taxi from her house to the airport. The taxi company charged a pick-up fee of $3.60 plus $1 per mile. The total fare was $25.60, not including the tip. Write and solve an equation which can be used to determine m, the number of miles in the taxi ride.

Equations in Context

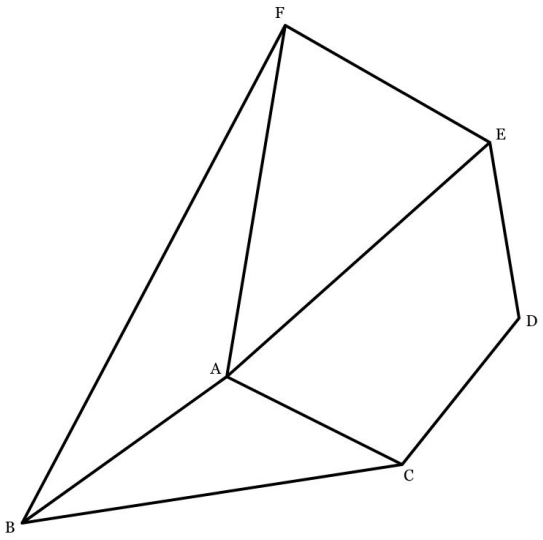
25. Under his cell phone plan, Jai pays a flat cost of $69.50 per month and $3 per gigabyte. He wants to keep his bill at $72.80 per month. Write and solve an equation which can be used to determine x, the number of gigabytes of data Jai can use while staying within his budget.

Geometry Review

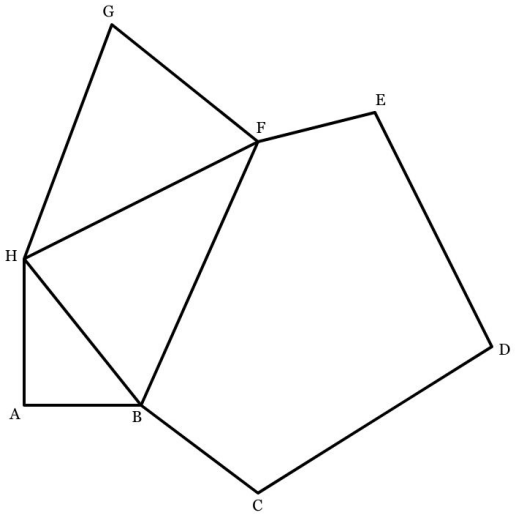
1. Identify $\angle BCF$ by by marking it with an arc on the diagram.



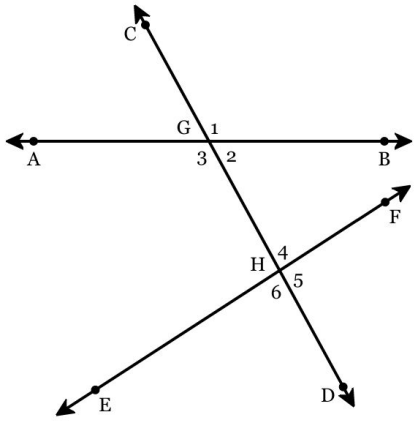
2. Identify $\angle EAC$ by by marking it with an arc on the diagram.



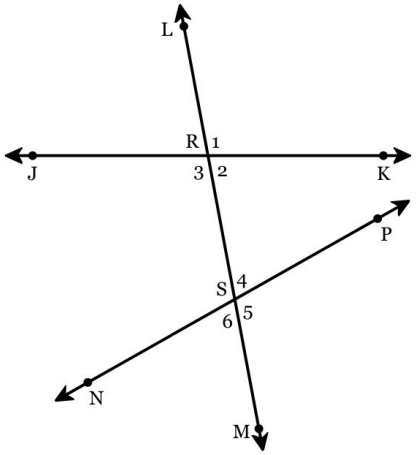
3. Identify $\angle BHA$ by by marking it with an arc on the diagram.



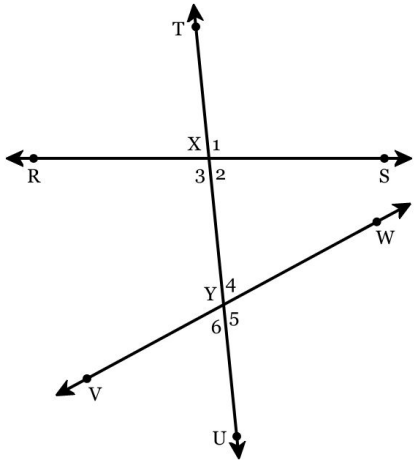
4. Which angle number represents an angle vertical to $\angle AGD$?



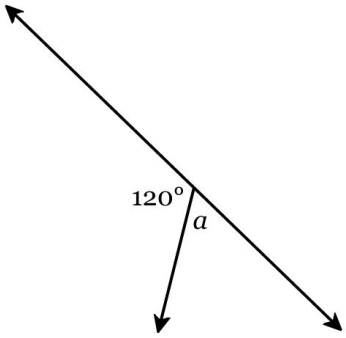
5. Which angle number represents an angle adjacent to $\angle NSM$?



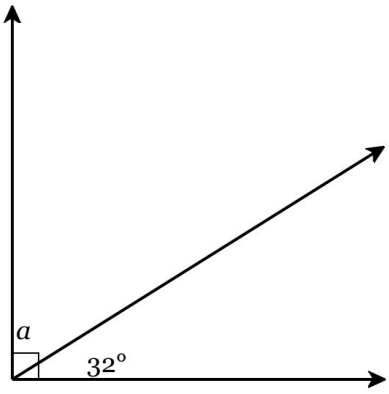
6. If $\mathrm{m}\angle VYU = 67°$, then what is $\mathrm{m}\angle TYW$?



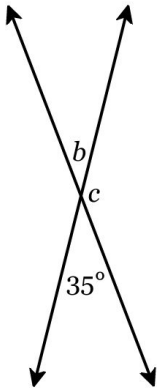
7. Find the measure of the missing angle.



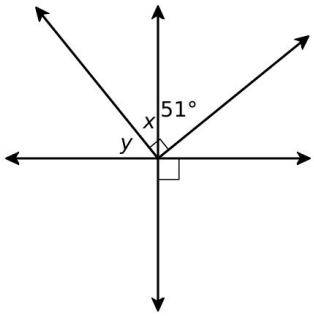
8. Find the measure of the missing angle.



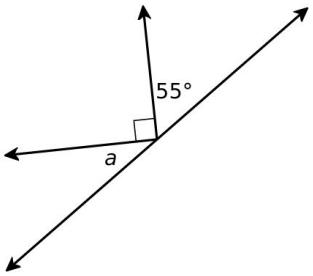
9. Find the measure of the missing angles.



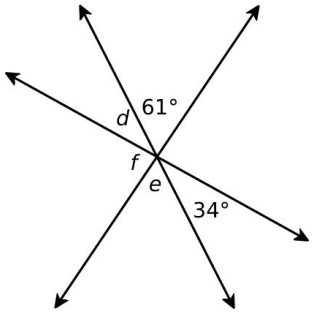
10. Find the degree measures x and y of the missing angles in the diagram below.



11. Find the degree measure a of the missing angle in the diagram below.



12. Find the degree measures d, e, and f of the missing angles in the diagram below.



13. The radius of a circle is 17 ft. Find its circumference in terms of π.

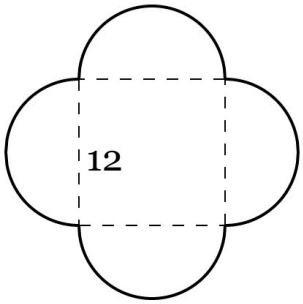
14. The diameter of a circle is 9 ft. Find its circumference in terms of π.

15. The diameter of a circle is 16 ft. Find its circumference in terms of π.

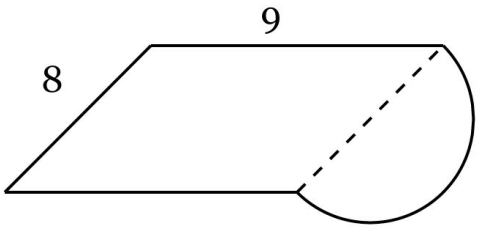
16. The radius of a circle is 10.9 ft. Find the circumference *to the nearest tenth.*

17. The diameter of a circle is 13 in. Find the circumference *to the nearest tenth.*

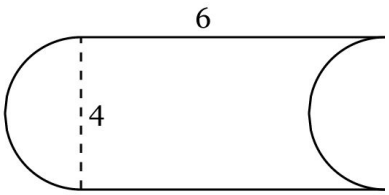
18. Find the Perimeter of the figure below, composed of a square and four semicircles. *Rounded to the nearest tenths place*



19. Find the Perimeter of the figure below, composed of a parallelogram and one semicircle. *Rounded to the nearest tenths place*



20. Find the Perimeter of the figure below, composed of a rectangle and two semicircles. *Round to the nearest tenths place*.



21. The diameter of a circle is 18 cm. Find its area in terms of π.

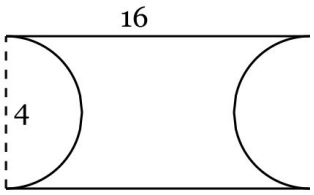
22. The radius of a circle is 20 in. Find its area in terms of π.

23. The diameter of a circle is 12 in. Find its area in terms of π.

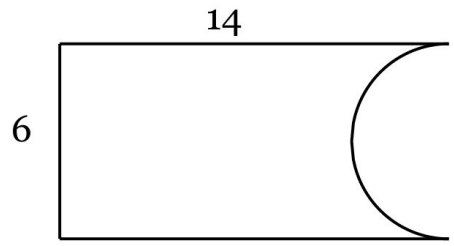
24. The radius of a circle is 21 m. Find its area *to the nearest whole number*.

25. The diameter of a circle is 14 m. Find its area *to the nearest whole number*.

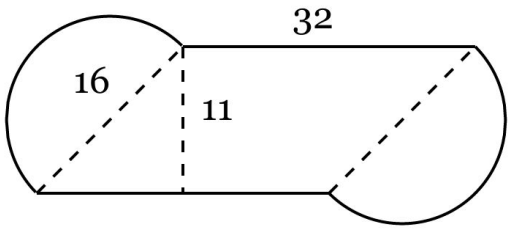
26. Find the Area of the figure below, composed of a rectangle with two semicircles removed. *Round to the nearest tenths place*.



27. Find the Area of the figure below, composed of a rectangle with a semicircle removed from it. *Round to the nearest tenths place*.



28. Find the Area of the figure below, composed of a parallelogram and two semicircles. *Round to the nearest tenths place*.



29. What is the volume, in cubic feet, of a cube with an edge length of 3 feet?

30. What is the volume, in cubic ft, of a rectangular prism with a height of 13ft, a width of 15ft, and a length of 9ft?

31. A rectangular prism has a length of 13 meters, a height of 18 meters, and a width of 5 meters. What is its volume, in cubic meters?

Ratios

1. Find the ratio of squares to total shapes in the diagram below.

Unsimplified ratio of squares to total shapes:

[ ] : [ ]

For every 1 square there are 2 total shapes, therefore the simplified ratio of squares to total shapes is 1 : 2.

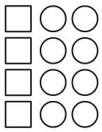
2. Find the ratio of triangles to circles in the diagram below.

Unsimplified ratio of triangles to circles:

[ ] : [ ]

For every 1 triangle there are 1 circles, therefore the simplified ratio of triangles to circles is 1 : 1.

3. Find the ratio of squares to total shapes in the diagram below.



Unsimplified ratio of squares to total shapes:

[ ] : [ ]

For every 1 square there are 3 total shapes, therefore the simplified ratio of squares to total shapes is 1 : 3.

4. There are 42 lollipops and 60 candy bars for a gift bag. In other words, lollipops and candy bars are in a 42:60 ratio.

L L L L L L L C C C C C C C C C C
L L L L L L L C C C C C C C C C C
L L L L L L L C C C C C C C C C C
L L L L L L L C C C C C C C C C C
L L L L L L L C C C C C C C C C C
L L L L L L L C C C C C C C C C C

These lollipops and candy bars can be put into smaller equal groups. For example, an equivalent ratio of 21:30 can be grouped like this:

L L L L L L L L L L L L L L L L L L L L L	C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C
L L L L L L L L L L L L L L L L L L L L L	C C C C C C C C C C C C C C C C C C C C C C C C C C C C C C

Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ lollipops for every _____ candy bars.

All equivalent ratios:

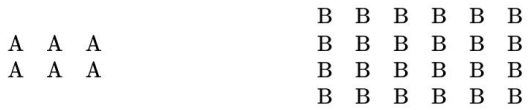
There are 42 lollipops for every 60 candy bars (42:60 ratio)
There are 21 lollipops for every 30 candy bars (21:30 ratio)
There are 14 lollipops for every 20 candy bars (14:20 ratio)
There are 7 lollipops for every 10 candy bars (7:10 ratio)

One possible drawing (14:20 ratio):

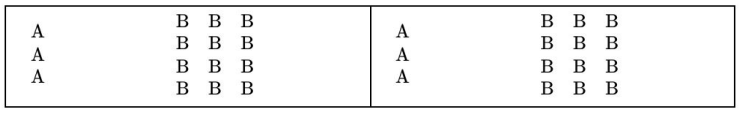
L L L L C C C C L L C C C C L L C C C C L L C C C C L L C C C C L L	L L L L C C C C L L C C C C L L C C C C L L C C C C L L C C C C L L	L L L L C C C C L L C C C C L L C C C C L L C C C C L L C C C C L L

Ratios

5. There are 6 apples and 24 bananas for a fruit basket. In other words, apples and bananas are in a 6:24 ratio.



These apples and bananas can be put into smaller equal groups. For example, an equivalent ratio of 3:12 can be grouped like this:



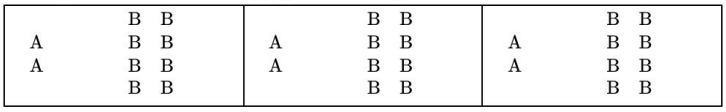
Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ apples for every _____ bananas.

All equivalent ratios:

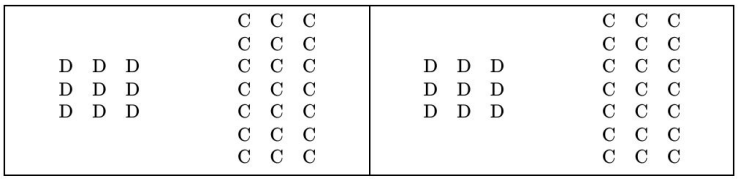
There are	6	apples for every	24 bananas	(6:24 ratio)
There are	3	apples for every	12 bananas	(3:12 ratio)
There are	2	apples for every	8 bananas	(2:8 ratio)
There is	1	apple for every	4 bananas	(1:4 ratio)

One possible drawing (2:8 ratio):



6. There are 18 dogs and 42 cats at a pet daycare. In other words, dogs and cats are in a 18:42 ratio.

These dogs and cats can be put into smaller equal groups. For example, an equivalent ratio of 9:21 can be grouped like this:



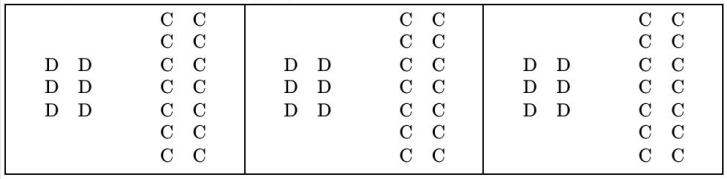
Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ dogs for every _____ cats.

All equivalent ratios:

There are	18	dogs for every	42 cats	(18:42 ratio)
There are	9	dogs for every	21 cats	(9:21 ratio)
There are	6	dogs for every	14 cats	(6:14 ratio)
There are	3	dogs for every	7 cats	(3:7 ratio)

One possible drawing (6:14 ratio):



Ratios

7. There are 8 lollipops and 24 candy bars for a gift bag. In other words, lollipops and candy bars are in a 8:24 ratio.

L L L L
L L L L

C C C C C C
C C C C C C
C C C C C C
C C C C C C

These lollipops and candy bars can be put into smaller equal groups. For example, an equivalent ratio of 4:12 can be grouped like this:

L L L L	C C C C C C C C C C C C
L L L L	C C C C C C C C C C C C

Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ lollipops for every _____ candy bars.

All equivalent ratios:

There are	8	lollipops for every	24	candy bars (8:24 ratio)
There are	4	lollipops for every	12	candy bars (4:12 ratio)
There are	2	lollipops for every	6	candy bars (2:6 ratio)
There is	1	lollipop for every	3	candy bars (1:3 ratio)

One possible drawing (2:6 ratio):

L L	C C C C C C	L L	C C C C C C
L L	C C C C C C	L L	C C C C C C

8. There are 48 apples and 40 bananas for a fruit basket. In other words, apples and bananas are in a 48:40 ratio.

A A A A A A A A
A A A A A A A A
A A A A A A A A
A A A A A A A A
A A A A A A A A
A A A A A A A A

B B B B B B B B
B B B B B B B B
B B B B B B B B
B B B B B B B B
B B B B B B B B

These apples and bananas can be put into smaller equal groups. For example, an equivalent ratio of 24:20 can be grouped like this:

A A A A A A A A A A A A A A A A A A A A A A A A	B B B B B B B B B B B B B B B B B B B B
A A A A A A A A A A A A A A A A A A A A A A A A	B B B B B B B B B B B B B B B B B B B B

Find another equivalent ratio. Use your ratio to fill in the blanks, and then draw the groups below.

There are _____ apples for every _____ bananas.

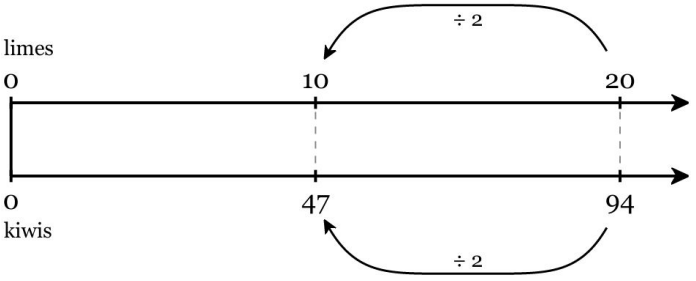
All equivalent ratios:

There are	48	apples for every	40	bananas (48:40 ratio)
There are	24	apples for every	20	bananas (24:20 ratio)
There are	12	apples for every	10	bananas (12:10 ratio)
There are	6	apples for every	5	bananas (6:5 ratio)

One possible drawing (12:10 ratio):

A A A A A A A A A A A A	B B B B B B B B	A A A A A A A A A A A A	B B B B B B B B
A A A A A A A A A A A A	B B B B B B B B	A A A A A A A A A A A A	B B B B B B B B

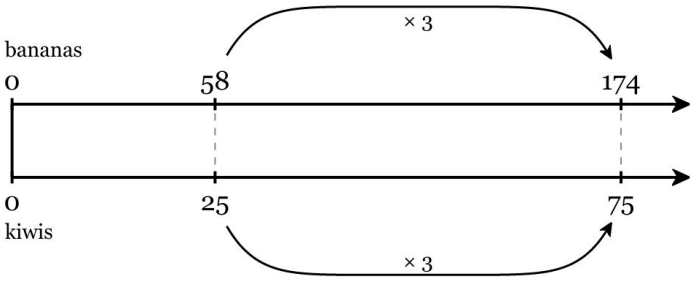
9. Genesis has kiwis and limes in a ratio of 94:20. How many kiwis does she have if she has 10 limes? (a) On the double number line below, fill in the given values, then use multiplication or division to find the missing value. (b) Complete the sentence.



Genesis has 47 kiwis if she has 10 limes.

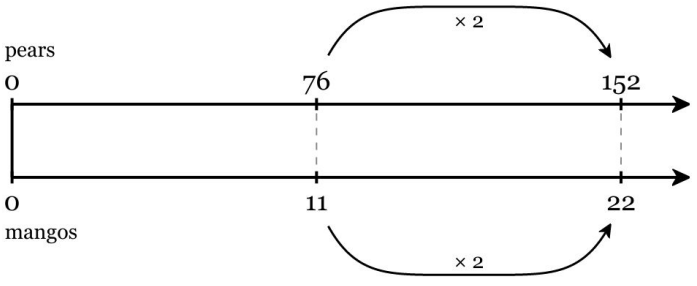
Ratios

10. Wyatt has kiwis and bananas in a ratio of 25:58. How many bananas does he have if he has 75 kiwis? (a) On the double number line below, fill in the given values, then use multiplication or division to find the missing value. (b) Complete the sentence.



Wyatt has 174 bananas if he has 75 kiwis.

11. Evan has mangos and pears in a ratio of 11:76. How many pears does he have if he has 22 mangos? (a) On the double number line below, fill in the given values, then use multiplication or division to find the missing value. (b) Complete the sentence.



Evan has 152 pears if he has 22 mangos.

12. A bookstore sells 6 books for $75. Which table represents the relationship between number of books and the total price?

A

Books	Cost
1	$12.50
2	$13.50
3	$14.50

B

Books	Cost
1	$12.50
11	$22.50
21	$32.50

C

Books	Cost
6	$75
12	$81
18	$87

D

Books	Cost
6	$75
7	$87.50
8	$100

13. Yasmin earns $45.75 for 3 hours of work. If she makes a constant hourly wage, which table represents the relationship between the number of hours she works and her total earnings?

A

Time (hours)	Pay
1	$15.25
2	$16.25
3	$17.25

B

Time (hours)	Pay
3	$45.75
6	$48.75
9	$51.75

C

Time (hours)	Pay
3	$45.75
4	$61
5	$76.25

D

Time (hours)	Pay
1	$15.25
11	$25.25
21	$35.25

Ratios

14. The ratio of students to adults on a field trip is 70 to 7. Which table correctly represents this ratio?

A

Students	Adults
10	1
11	2
12	3

B

Students	Adults
70	7
77	14
84	21

C

Students	Adults
70	7
80	8
90	9

D

Students	Adults
10	1
20	11
30	21

15. A recipe uses 4 cups of milk to make 24 servings. If the same amount of milk is used for each serving, how many servings can be made from three quarts?

(a) three quarts = **12** cups

(b) **72** servings can be made from three quarts.

16. Arianys drives 5 miles in 10 minutes. If she drove two hours in total at the same rate, how far did she go?

(a) 2 hours = **120** minutes

(b) Arianys would drive **60** miles in two hours.

17. Alexandra bought two pounds of strawberries for $12.80. What is the price, in dollars per *ounce* of strawberries?

(a) 2 pounds = **32** ounces

(b) The price of strawberries is **$0.40** per ounce.

Ratios

18. A grocery store sells a bag of 3 oranges for $1.92. How much would it cost for 8 oranges?

$5.12

19. It cost Eva $29.85 to send 199 text messages. How much would it cost to send 179 text messages?

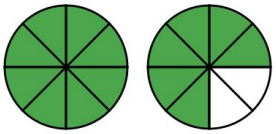
$26.85

20. Olivia drove 105 miles in 3 hours. If she continued at the same rate, how long would it take to travel 560 miles?

16 hours

Rational Number Conversions

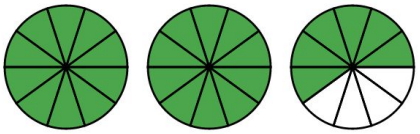
1. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.



Fraction: $\frac{14}{8}$

Mixed Number: $1\frac{6}{8}$

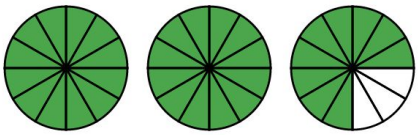
2. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.



Fraction: $\frac{26}{10}$

Mixed Number: $2\frac{6}{10}$

3. Assume that each circle shown below represents one unit. Express the shaded amount as a single fraction and as a mixed number.



Fraction: $\frac{33}{12}$

Mixed Number: $2\frac{9}{12}$

4. Simplify: $\frac{40}{110}$

$\boxed{\frac{4}{11}}$

5. Simplify: $\frac{32}{110}$

$\boxed{\frac{16}{55}}$

6. Simplify: $\frac{12}{48}$

$\boxed{\frac{1}{4}}$

7. Simplify: $\frac{70}{88}$

$\boxed{\frac{35}{44}}$

8. Simplify: $\frac{18}{20}$

$\boxed{\frac{9}{10}}$

9. Round 8.11 to the nearest tenth.

$\boxed{8.1}$

10. Round 2.1486 to the nearest hundredth.

$\boxed{2.15}$

11. Round 3.29 to the nearest whole number.

$\boxed{3}$

Rational Number Conversions

12. Round 64899.4100117 to the nearest ten.

64900

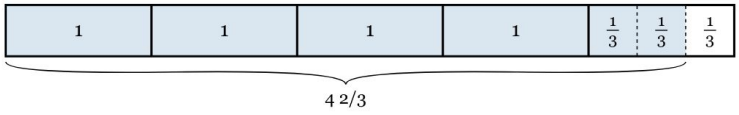
13. Round 531.775197122 to the nearest ten-thousandth.

531.7752

14. Round 231469.335329 to the nearest thousand.

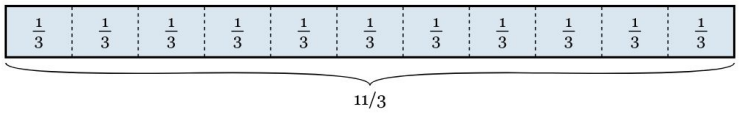
231000

15. Convert $4\frac{2}{3}$ into an improper fraction.



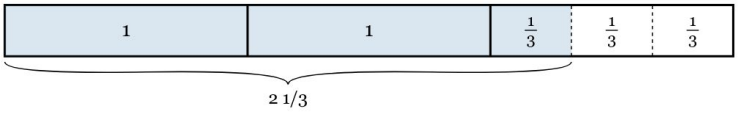
$\frac{14}{3}$

16. Convert $\frac{11}{3}$ into a mixed number.



$3\frac{2}{3}$

17. Convert $2\frac{1}{3}$ into an improper fraction.



$\frac{7}{3}$

18. Convert $\frac{35}{6}$ into a mixed number.

$5\frac{5}{6}$

19. Convert $7\frac{1}{4}$ into an improper fraction.

$\frac{29}{4}$

20. Convert $6\frac{4}{5}$ into an improper fraction.

$\frac{34}{5}$

21. Convert $\frac{19}{10}$ into a mixed number.

$1\frac{9}{10}$

Rational Number Conversions

22. Convert $6\frac{7}{8}$ into an improper fraction.

$$\boxed{\frac{55}{8}}$$

23. Convert $\frac{9}{50}$ into a decimal.

$$\boxed{\text{Final answer: } 0.18}$$

24. Convert $\frac{11}{12}$ into a decimal.

$$\boxed{0.91\overline{6}}$$

25. Convert $\frac{19}{50}$ into a decimal.

$$\boxed{\text{Final answer: } 0.38}$$

26. Convert $\frac{13}{20}$ into a decimal.

$$\boxed{\text{Final answer: } 0.65}$$

27. Convert $\frac{11}{50}$ into a decimal.

$$\boxed{\text{Final answer: } 0.22}$$

28. Convert 0.637 to a fraction in simplest form.

$$\boxed{\frac{637}{1000}}$$

29. Convert 0.934 to a fraction in simplest form.

$$\boxed{\frac{467}{500}}$$

30. Convert 0.263 to a fraction in simplest form.

$$\boxed{\frac{263}{1000}}$$

31. Convert 0.676 to a fraction in simplest form.

$$\boxed{\frac{169}{250}}$$

32. Convert 0.255 to a fraction in simplest form.

$$\boxed{\frac{51}{200}}$$

Rational Number Conversions

33. Convert $.\overline{28}$ to a fraction in simplest form.

$$\boxed{.\overline{28} = \frac{28}{99}}$$

34. Convert $.2\overline{7}$ to a fraction in simplest form.

$$\boxed{.2\overline{7} = \frac{5}{18}}$$

35. Convert $.\overline{5}$ to a fraction in simplest form.

$$\boxed{.\overline{5} = \frac{5}{9}}$$

36. Convert $.4\overline{7}$ to a fraction in simplest form.

$$\boxed{.4\overline{7} = \frac{43}{90}}$$

37. Convert $.\overline{03}$ to a fraction in simplest form.

$$\boxed{.\overline{03} = \frac{1}{33}}$$

Rational Number Operations

1. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{3}{4} + \frac{7}{32}$$

$$\boxed{\frac{31}{32}}$$

2. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{11}{17} - \frac{1}{17}$$

$$\boxed{\frac{10}{17}}$$

3. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{11}{8} + \frac{8}{3}$$

$$\boxed{\frac{97}{24}}$$

4. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{7}{16} - \frac{11}{20}$$

$$\boxed{-\frac{9}{80}}$$

5. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{1}{10} + \frac{7}{10}$$

$$\boxed{\frac{4}{5}}$$

6. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{7}{10} + \left(-\frac{5}{6}\right)$$

$$\boxed{-\frac{23}{15}}$$

7. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{5}{12} - \left(-\frac{9}{11}\right)$$

$$\boxed{\frac{53}{132}}$$

8. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{7}{17} + \left(-\frac{12}{17}\right)$$

$$\boxed{-\frac{5}{17}}$$

Rational Number Operations

9. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{1}{6}+\frac{4}{9}$$

$\boxed{\frac{5}{18}}$

10. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{5}{12}-\left(-\frac{9}{11}\right)$$

$\boxed{\frac{53}{132}}$

11. Perform the operation below. Express your answer as a mixed number in simplest form.

$$4\tfrac{3}{10}-2\tfrac{7}{9}$$

$\boxed{1\frac{47}{90}}$

12. Perform the operation below. Express your answer as a mixed number in simplest form.

$$4\tfrac{5}{8}+1\tfrac{3}{5}$$

$\boxed{6\frac{9}{40}}$

13. Perform the operation below. Express your answer as a mixed number in simplest form.

$$3\tfrac{1}{10}+2\tfrac{2}{5}$$

$\boxed{5\frac{1}{2}}$

14. Perform the operation below. Express your answer as a mixed number in simplest form.

$$4\tfrac{1}{6}+1\tfrac{2}{5}$$

$\boxed{5\frac{17}{30}}$

15. Perform the operation below. Express your answer as a mixed number in simplest form.

$$3\tfrac{1}{2}+4\tfrac{3}{8}$$

$\boxed{7\frac{7}{8}}$

16. Perform the operation below. Express your answer as a mixed number in simplest form.

$$3\tfrac{1}{2}-\left(-1\tfrac{9}{10}\right)$$

$\boxed{5\frac{2}{5}}$

Rational Number Operations

17. Perform the operation below. Express your answer as a mixed number in simplest form.

$$3\tfrac{2}{3} - 1\tfrac{3}{5}$$

$2\frac{1}{15}$

18. Perform the operation below. Express your answer as a mixed number in simplest form.

$$-4\tfrac{7}{8} - \left(-1\tfrac{1}{2}\right)$$

$-3\frac{3}{8}$

19. Perform the operation below. Express your answer as a mixed number in simplest form.

$$-3\tfrac{3}{5} + 2\tfrac{1}{4}$$

$-1\frac{7}{20}$

20. Perform the operation below. Express your answer as a mixed number in simplest form.

$$-3\tfrac{1}{2} - 1\tfrac{3}{4}$$

$-5\frac{1}{4}$

21. Perform the operation and simplify the answer fully.

$$\frac{1}{8} \cdot \frac{3}{4}$$

$\frac{3}{32}$

$3/32$

22. Perform the operation and simplify the answer fully.

$$\frac{6}{7} \cdot \frac{5}{3}$$

$\frac{10}{7}$

$10/7$

23. Perform the operation and simplify the answer fully.

$$\frac{\frac{3}{2}}{\frac{5}{6}}$$

$\frac{9}{5}$

$9/5$

24. Perform the operation and simplify the answer fully.

$$\frac{\frac{1}{2}}{\frac{5}{9}}$$

$\frac{9}{10}$

$9/10$

25. Perform the operation and simplify the answer fully.

$$\frac{1}{4} \cdot \frac{7}{2}$$

$\frac{7}{8}$

7/8

26. Perform the operation and reduce the answer fully. Make sure to express your answer as a simplified fraction.

$$\frac{1}{2} \cdot \frac{3}{5}$$

$\frac{3}{10}$

$\frac{3}{10}$

27. Perform the operation and reduce the answer fully. Make sure to express your answer as a simplified fraction.

$$\frac{-\frac{5}{7}}{\frac{5}{8}}$$

$-\frac{8}{7}$

$-\frac{8}{7}$

28. Perform the operation and reduce the answer fully. Make sure to express your answer as a simplified fraction.

$$-\frac{7}{8} \cdot \frac{10}{7}$$

$-\frac{5}{4}$

$-\frac{5}{4}$

29. Enter the missing values in the area model to find: $6 \cdot 9\frac{4}{5}$. Express your final answer as a mixed number or a whole number.

	9	4/5
6	54	24/5

$$6 \cdot 9\frac{4}{5} = 58\frac{4}{5}$$

30. Enter the missing values in the area model to find: $20\frac{1}{2} \div 4$. Express your final answer as a mixed number or a whole number.

	5	1/8
4	20	1/2

$$20\frac{1}{2} \div 4 = 5\frac{1}{8}$$

31. Enter the missing values in the area model to find: $48\frac{1}{4} \div 6$. Express your final answer as a mixed number or a whole number.

	8	1/24
6	48	1/4

$$48\frac{1}{4} \div 6 = 8\frac{1}{24}$$

Rational Number Operations

32. Evaluate the expression shown below and write your answer as a mixed number in simplest form.

$$-4\frac{9}{10} \div \frac{9}{10}$$

$$\boxed{-5\frac{4}{9}}$$

33. Evaluate the expression shown below and write your answer as a mixed number in simplest form.

$$-1\frac{1}{2} \times 3\frac{5}{6}$$

$$\boxed{-5\frac{3}{4}}$$

34. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$\frac{1}{5} \div -\frac{2}{7}$$

$$\boxed{-\frac{7}{10}}$$

35. Evaluate the expression shown below and write your answer **as a fraction** in simplest form.

$$-\frac{5}{7} \cdot \frac{7}{9}$$

$$\boxed{\frac{-35}{63} = \frac{-5 \cdot \cancel{7}}{9 \cdot \cancel{7}} = \frac{-5}{9} = -\frac{5}{9}}$$

36. Evaluate the expression shown below and write your answer as a mixed number in simplest form.

$$-5\frac{6}{7} \times \frac{9}{10}$$

$$\boxed{-5\frac{19}{70}}$$

37. Perform the operation and simplify the answer fully.

$$\frac{\frac{9}{8} + \frac{1}{12}}{\frac{1}{3}}$$

$$\boxed{\frac{29}{8}}$$

38. Perform the operation and simplify the answer fully.

$$\frac{\frac{4}{7}}{-\frac{1}{2}}$$

$$\boxed{-\frac{8}{7}}$$

39. Perform the operation and simplify the answer fully.

$$\frac{\frac{1}{2}}{\frac{5}{6}+\frac{1}{10}}$$

$$\boxed{\frac{15}{28}}$$

40. Perform the operation and simplify the answer fully.

$$\frac{\frac{1}{6}}{-3}$$

$$\boxed{-\frac{1}{18}}$$

41. Perform the operation and simplify the answer fully.

$$\frac{\frac{10}{7}}{9}$$

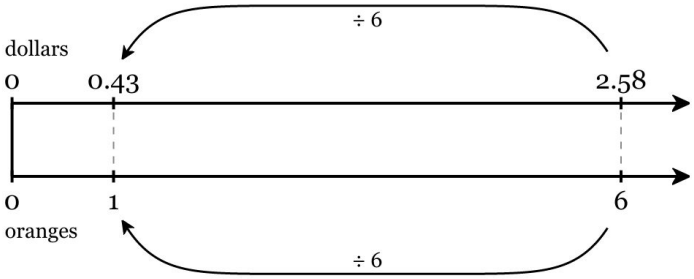
$$\boxed{\frac{10}{63}}$$

Unit Rates / Reasoning

1. It cost Josiah $0.27 to send 3 text messages. How much does each text cost to send?

Each text costs $0.09 to send.

2. A grocery store sells a bag of 6 oranges for $2.58. What is the cost of oranges, in dollars per orange? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.

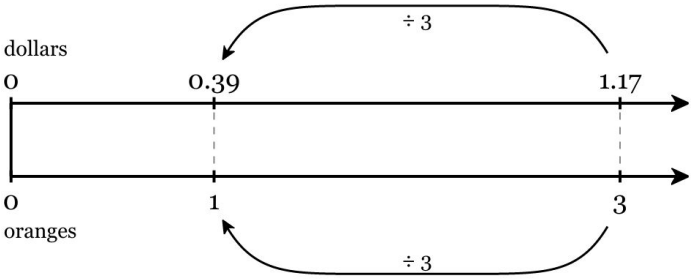


The cost of oranges is $0.43 per orange.

3. Jace earned $81.00 at his job when he worked for 5 hours. What did he earn in one hour?

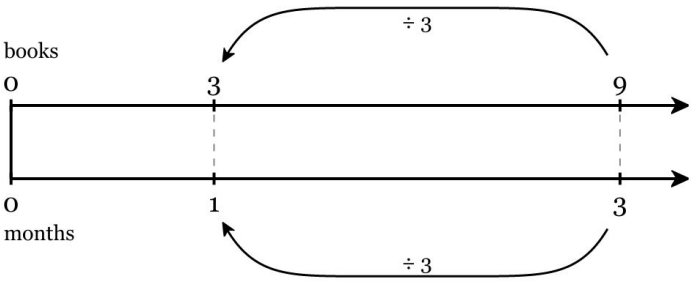
He earned $16.20 in one hour.

4. A grocery store sells a bag of 3 oranges for $1.17. What is the unit cost? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.



The unit cost is $0.39.

5. Genesis read 9 books in 3 months. If she reads at a constant rate, how many books did she read each month? Give your answer as a whole number or a FRACTION in simplest form. On the double number line below, fill in the given values, then use multiplication or division to find the missing value.



She read **3** books each month.

6. Ellie drove 270 miles in 6 hours. On average, how fast did she drive, in miles per hour?

She drove at 45 miles per hour, on average.

7. Isaiah earned $237.00 at his job when he worked for 10 hours. How much money did he earn each hour?

He earned $23.70 each hour.

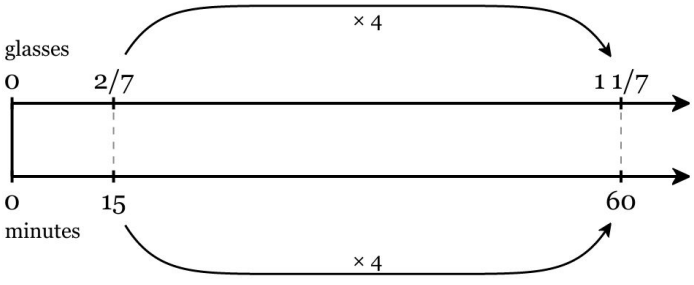
8. Jose earned $488.00 at his job when he worked for 20 hours. How much money did he earn each hour?

He earned $24.40 each hour.

9. On average, Avani drinks $\frac{2}{7}$ of a 10-ounce glass of water in 15 minutes. How many glasses of water does she drink in one hour? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.

To enter a mixed number on the double number line, use a space and the slash key. For example: 3 1/2

Enter your final answer as a whole number, proper fraction, or mixed number in simplest form.

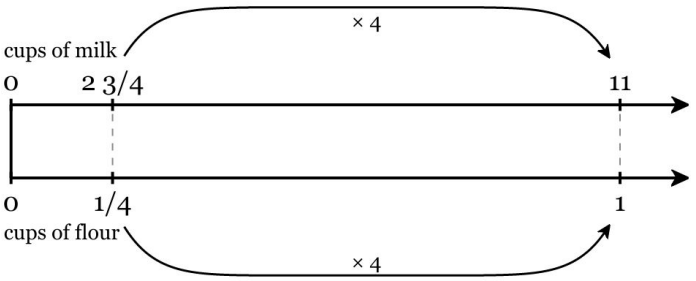


She drinks $1\frac{1}{7}$ glasses in one hour.

10. A recipe requires $2\frac{3}{4}$ cups of milk for every $\frac{1}{4}$ of a cup of flour. How many cups of milk are required for each cup of flour? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.

To enter a mixed number on the double number line, use a space and the slash key. For example: 3 1/2

Enter your final answer as a whole number, proper fraction, or mixed number in simplest form.

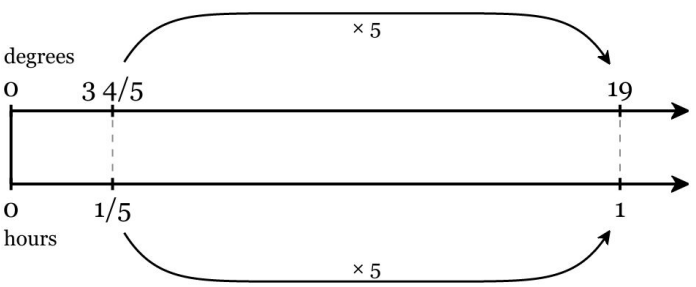


11 cups of milk are required for each cup of flour.

11. Amira conducted a scientific experiment. For a certain time, the temperature of a compound rose $3\frac{4}{5}$ degrees in $\frac{1}{5}$ of an hour. What was the rate, in degrees per hour, that the temperature of the compound rose? On the double number line below, fill in the given values, then use multiplication or division to find the missing value.

To enter a mixed number on the double number line, use a space and the slash key. For example: 3 1/2

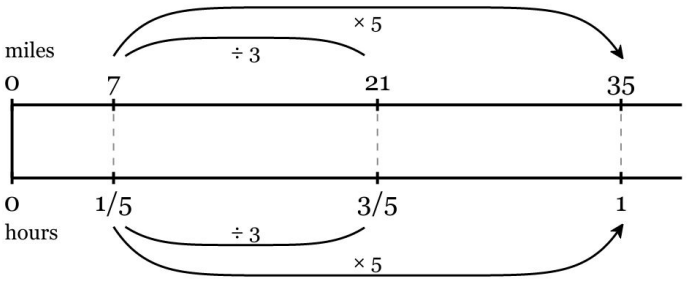
Enter your final answer as a whole number, proper fraction, or mixed number in simplest form.



The temperature of the compound rose 19 degrees per hour.

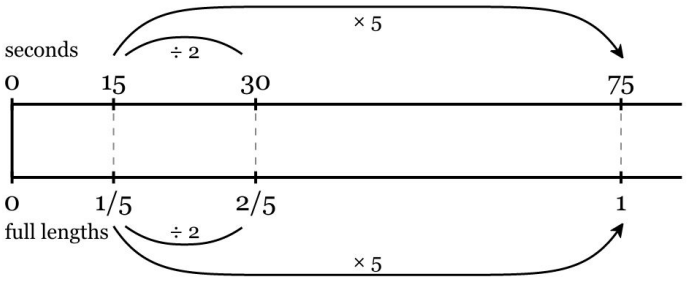
Unit Rates / Reasoning

12. Jayden drove 21 miles in $\frac{3}{5}$ hours. On average, how fast did he drive, in miles per hour?



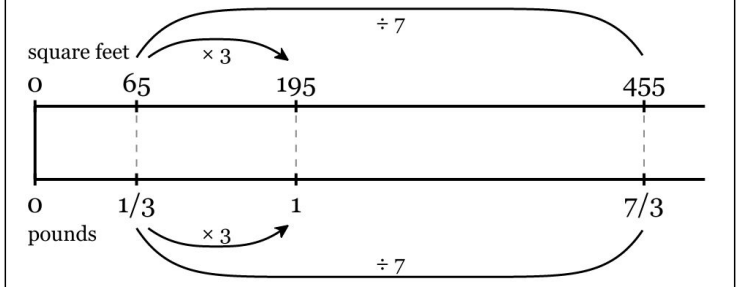
He drove at 35 miles per hour, on average.

13. Julian observes a marble travel along a horizontal path at a constant rate. The marble travels $\frac{2}{5}$ of the length of the path in 30 seconds. At that rate, how many seconds does it take the object to travel the full length?



It takes 75 seconds to travel the full length.

14. The label on a $2\frac{1}{3}$-pound bag of seeds states that it will cover an area of 455 square feet. What is the area that one pound of seeds will cover?



One pound of seeds will cover 195 square feet.

15. Meena was driving down a road and after 4 hours she had traveled 98 miles. At this speed, how many miles could Meena travel in 10 hours? Fill out the table of equivalent ratios until you have found the value of x.

Miles	Hours
98	4
49	2
245	10

After driving for 10 hours, Meena traveled **245** miles.

16. For a given recipe, 2 cups of flour are mixed with 14 cups of sugar. How many cups of sugar should be used if 22 cups of flour are used? Assuming a constant ratio, fill out the table of equivalent ratios until you have found the value of x.

Flour	Sugar
2	14
22	154

154 cups of sugar should be mixed with 22 cups of flour.

17. At a local print shop, 10 copies can be made for $4. At this rate, how many copies could be made for $36? Fill out the table of equivalent ratios until you have found the value of x.

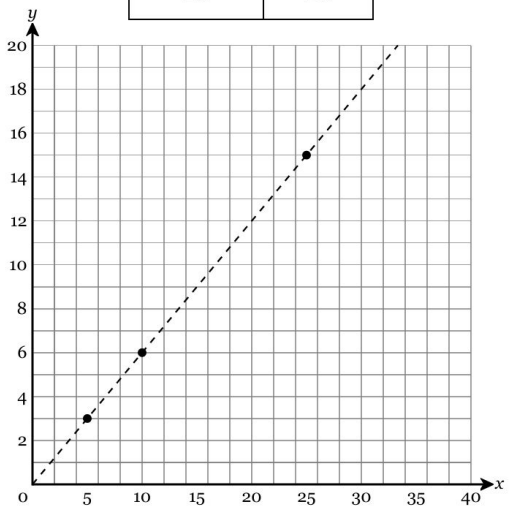
Copies	Dollars
10	4
90	36

It would cost $36 to make **90** copies.

18. 10 customers entered a store over the course of 6 minutes. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

Customers	Minutes
5	___
10	6
___	15

Customers	Minutes
5	3
10	6
25	15

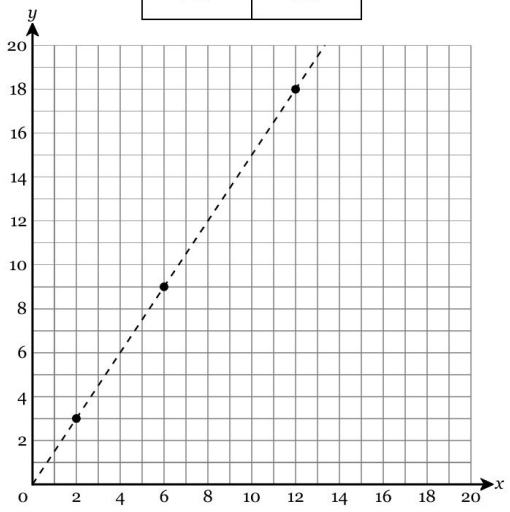


Unit Rates / Reasoning

19. Feng mowed 6 lawns in 9 hours. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

Lawns	Hours
2	___
6	9
___	18

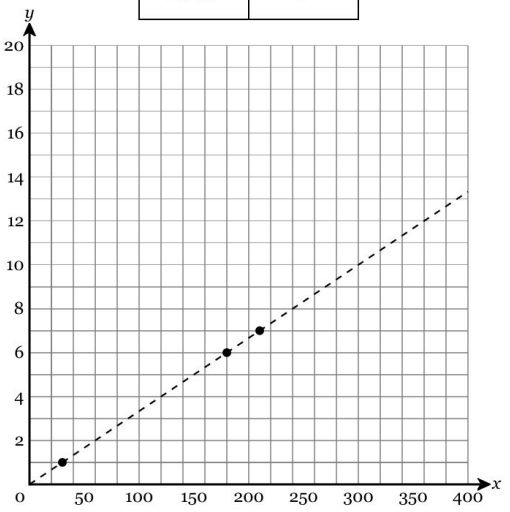
Lawns	Hours
2	3
6	9
12	18



20. Connor's car used 7 gallons of gas to drive 210 miles. Fill out a table of equivalent ratios and plot the points on the coordinate axes provided.

Miles	Gallons
___	1
180	___
210	7

Miles	Gallons
30	1
180	6
210	7



Proportional Relationships

1. The table below shows Ayden's earnings on the job.

Time (hours)	Earnings (dollars)
11	$377.30
23	$788.90
35	$1200.50

What is the constant of proportionality between earnings and time in hours?

$k = 34.3$

2. Ariana buys 10 bottles of grapefruit juice at the corner store for a total cost of $11.80. If each bottle costs the same amount, how much is each bottle of juice?

$1.18 per bottle of juice

3. A company orders 15 boxed lunches from a deli for $128.25. If each boxed lunch costs the same amount, what is the unit cost of each boxed lunch?

$8.55

4. The length of a cell phone is 1.6 inches and the width is 3.6 inches. The company making the cell phone wants to make a new version whose length will be 1.2 inches. Assuming the side lengths in the new phone are proportional to the old phone, what will be the width of the new phone?

The width of the new phone will be 2.7 inches.

5. A $7\frac{1}{2}$-inch candle burns down in 10 hours. After how many hours will it have burned $6\frac{3}{8}$ inches?

It will have burned $6\frac{3}{8}$ inches after $8\frac{1}{2}$ hours or 8.5 hours.

6. At the neighborhood grocery, 2.5 pounds of salmon cost $\$21.35$. Dianelys spent $\$12.81$ on salmon. How many pounds of salmon did she buy, to the nearest hundredth of a pound?

He spent $12.81 on 1.5 pounds of salmon.

7. The table below shows Makayla's earnings on the job.

Time (hours)	Earnings (dollars)
15	$387
21	$541.80
27	$696.60

How much does she make in 13.5 hours?

In 13.5 hours, she makes $348.30.

8. The table below lists the masses and volumes of several pieces of the same type of metal. There is a proportional relationship between the mass and the volume of the pieces of metal.

Volume (cubic centimeters)	Mass (grams)
5.1	23.052
9.7	43.844
11.7	52.884

Determine the volume, in cubic centimeters, of a piece of metal that has a mass of 62.828 grams. Round your answer to the nearest tenth.

A piece with mass 62.828 grams has volume 13.9 cm^3.

9. Julian was comparing the price of ground beef at two stores. The equation $y = 7.38x$ represents the total cost, in dollars and cents, y, that it costs for x pounds of ground beef at SuperGrocery A. The table below represents the total cost, in dollars and cents, y, that it costs for x pounds of ground beef at SuperGrocery B.

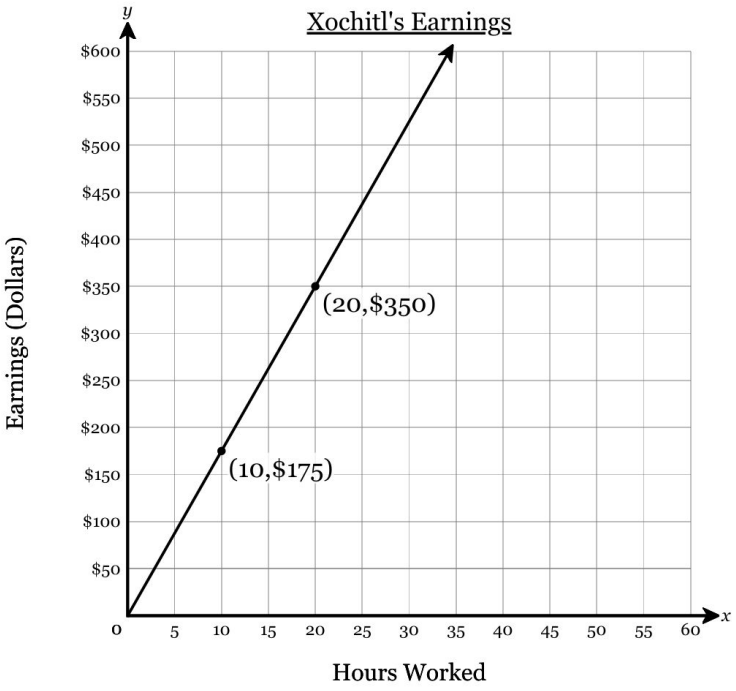
SuperGrocery B

Pounds (x)	Total Cost (y)
2	$18.72
2.5	$23.40
3.5	$32.76
4.5	$42.12

How much more expensive is it, per pound, to buy ground beef at Store B than at Store A?

It is $1.98 per pound more expensive to buy ground beef at SuperGrocery B than at SuperGrocery A.

10. Two friends, Nicole and Xochitl, took summer jobs. Nicole earned \$424.80 in 18 hours. The graph below represents Xochitl's earnings in dollars and cents, y, for working x hours.



How much more does Nicole earn per hour than Xochitl?

Nicole earns \$6.10 more per hour than Xochitl.

11. Scientists are preparing two satellites to be launched. The equation $y = 3000x$ represents the number of miles, y, that the satellite, Space Explorer A, flies in x hours. The table below represents the number of miles, y, that the satellite, Space Explorer B, flies in x hours.

Space Explorer B

Hours (x)	Miles (y)
10	22000
19	41800
21	46200
25	55000

How much faster does Space Explorer A travel per hour than Space Explorer B?

Space Explorer A travels 800 miles per hour faster than Space Explorer B.

12. Given the speeds of each runner below, determine who runs the fastest.

Emily runs 12 feet per second.

Will runs 510 feet in 46 seconds.

Stephanie runs 1 mile in 404 seconds.

Ron runs 874 feet in 1 minute.

A. Emily B. Will

C. Stephanie D. Ron

13. Given the speeds of each runner below, determine who runs the fastest.

Noah runs 11 feet per second.

Jessica runs 625 feet in 42 seconds.

Zach runs 1 mile in 424 seconds.

Jake runs 644 feet in 1 minute.

A. Noah
B. Jessica
C. Zach
D. Jake

14. Given the speeds of each runner below, determine who runs the fastest.

Frank runs 11 feet per second.

Emily runs 86 feet in 10 seconds.

Adam runs 1 mile in 388 seconds.

Noah runs 600 feet in 1 minute.

A. Frank
B. Emily
C. Adam
D. Noah

15. Given the speeds of each runner below, determine who runs the fastest.

Stephanie runs 9 feet per second.

Ron runs 255 feet in 22 seconds.

Liz runs 1 mile in 362 seconds.

Emily runs 605 feet in 1 minute.

A. Stephanie
B. Ron
C. Liz
D. Emily

16. Given the speeds of each runner below, determine who runs the fastest.

Stephanie runs 8 feet per second.

Zach runs 485 feet in 47 seconds.

Liz runs 1 mile in 540 seconds.

Adam runs 676 feet in 1 minute.

A. Stephanie
B. Zach
C. Liz
D. Adam

Proportional Relationships

17. Scarlett practices the piano the same number of minutes each day. The relationship between the number of days, x, and the total number of minutes she practices, y, is represented by a graph drawn in the xy-plane.

If the point $(2, 50)$ lies on the graph, what does the ordered pair $(2, 50)$ indicate?

A. Scarlett practices 50 minutes a day for 2 days

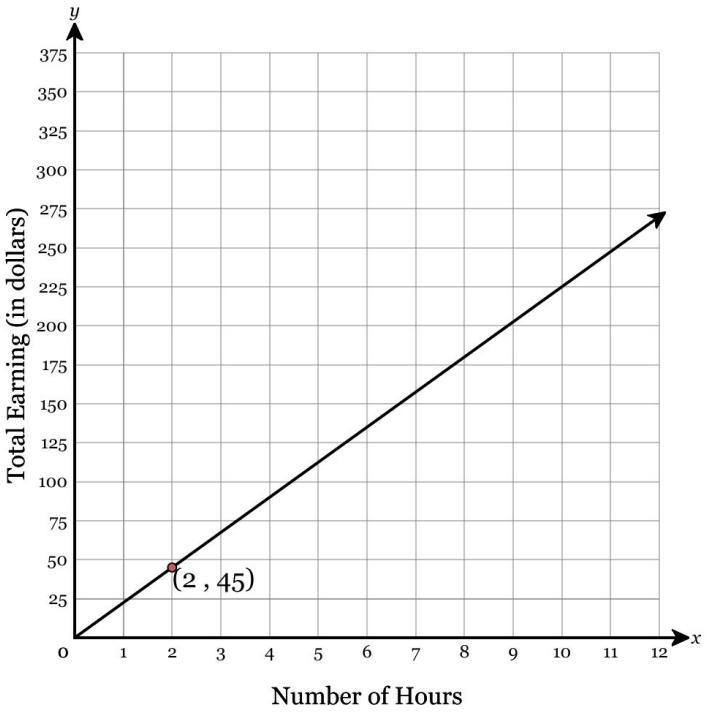
B. Scarlett practices a total of 50 minutes over 2 days

C. Scarlett practices a total of 2 minutes over 50 days

D. Scarlett practices 2 minutes a day for 50 days

18. Nayeli has just gotten a new job. The relationship between the number of hours she works, x, and her total earnings, y, is represented by the graph below.

What does the ordered pair $(2, 45)$ indicate?



A. Nayeli earns $45.00 per hour for 2 hours

B. Nayeli earns a total of $2.00 over 45 hours

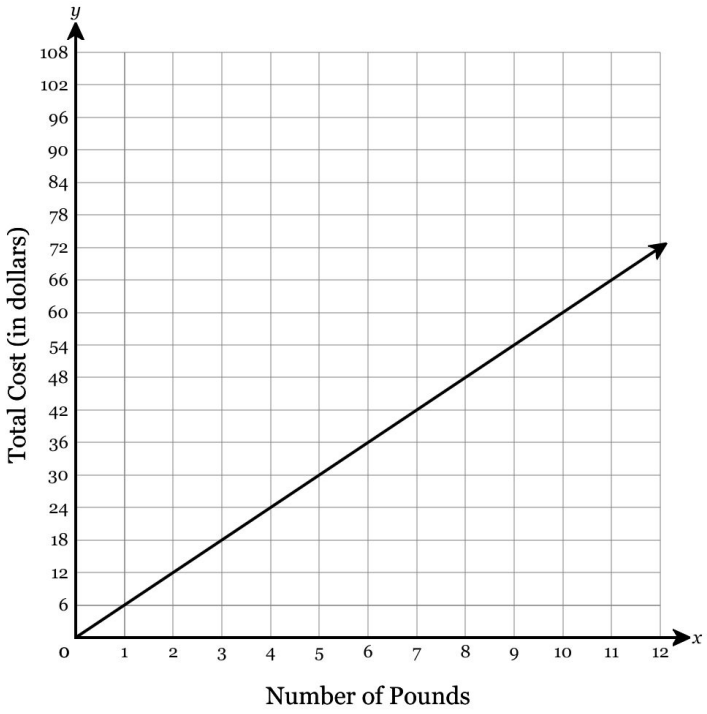
C. Nayeli earns a total of $45.00 over 2 hours

D. Nayeli earns $2.00 per hour for 45 hours

Proportional Relationships

19. A grocery store sells sliced turkey by weight. The relationship between the amount of turkey in pounds, x, and the total cost in dollars of the sliced turkey, y, is represented by the graph below.

What point on the graph represents the unit rate?

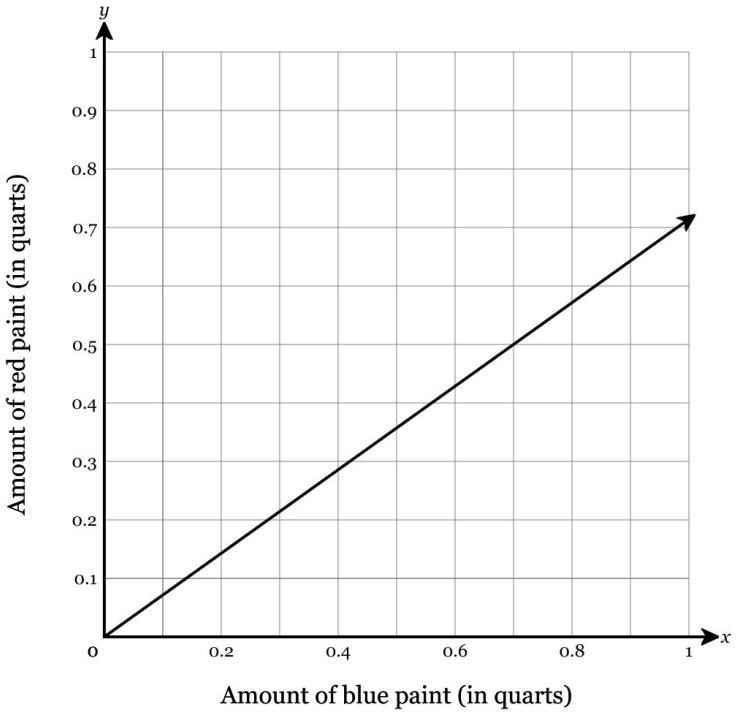


A. $(0\ ,\ 0)$ **B. $(1\ ,\ 6)$**

C. $(6\ ,\ 1)$ D. $(6\ ,\ 36)$

20. A certain shade of purple paint is made by mixing blue and red paint. The relationship between the number of quarts of blue paint in the mix, x, and the number of quarts of red paint, y, is represented by the graph below.

What is the constant of proportionality as shown in the graph?

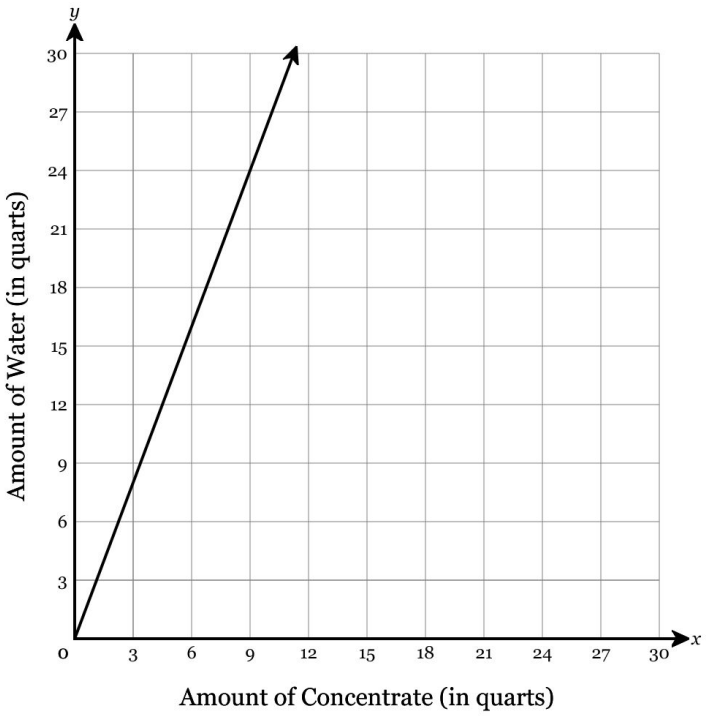


A. $\frac{1}{5}$ **B. $\frac{5}{7}$** C. $\frac{5}{12}$ D. $\frac{7}{12}$

Proportional Relationships

21. Isaac is making lemonade from concentrate. The relationship between the number of quarts of concentrate, x, and the number of quarts of water, y, is represented by the graph below.

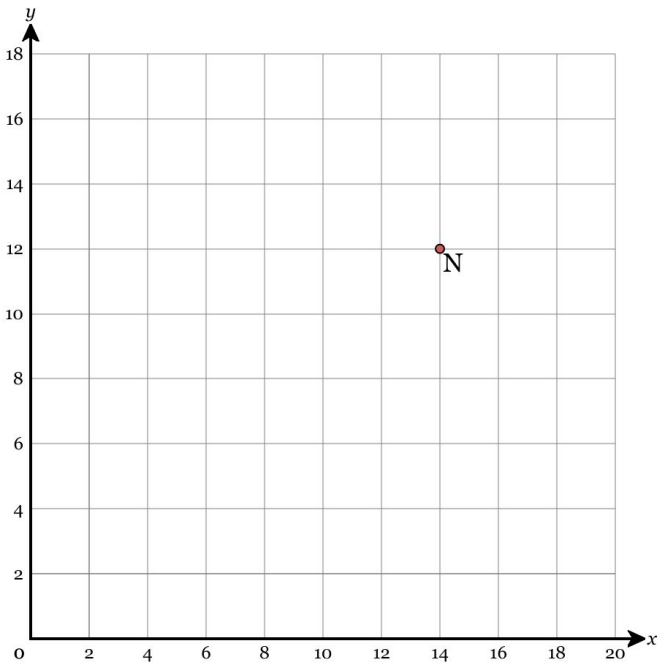
What is the constant of proportionality as shown in the graph?



A. $\frac{1}{3}$ **B. $\frac{8}{3}$** C. $\frac{3}{11}$ D. $\frac{8}{11}$

22. Line NM represents a proportional relationship. Point N lies at $(14, 12)$ as shown on the graph below.

Which ordered pair could represent the coordinates of point M?

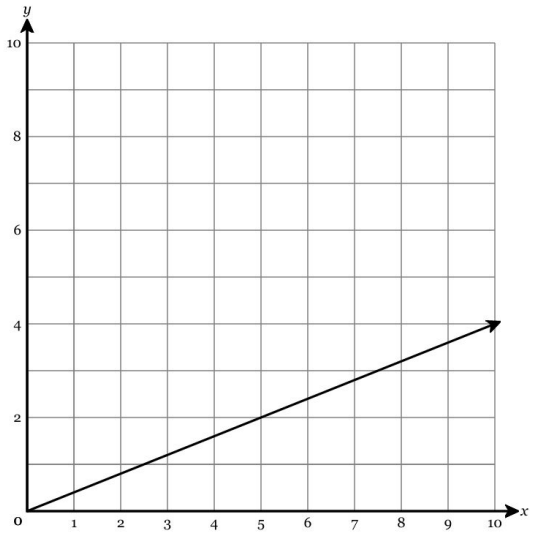


A. $(17.5\,,\,15)$ B. $(0.9\,,0)$

C. $(15\,,\,17.5)$ D. $(2,0)$

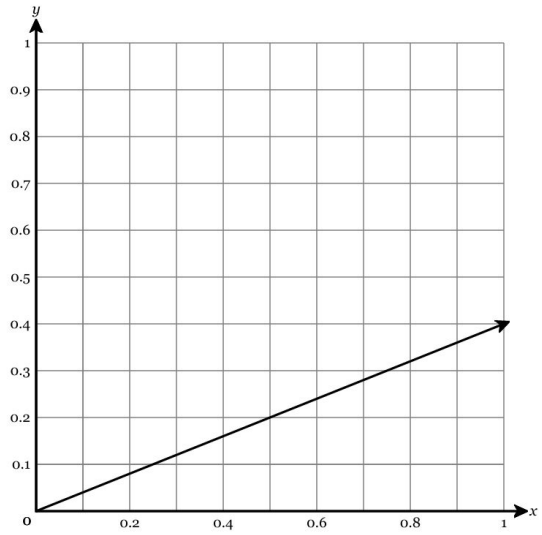
Proportional Relationships

23. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



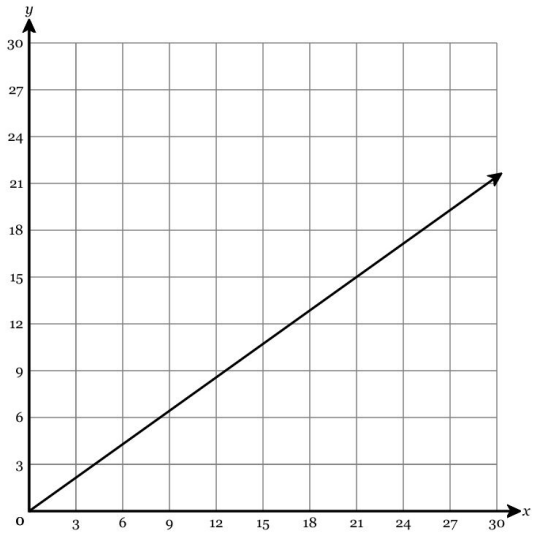
$$y = \frac{2}{5}x$$

24. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



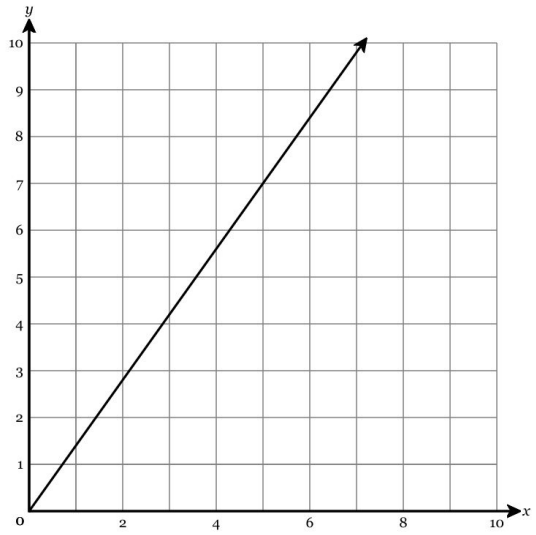
$$y = \frac{2}{5}x$$

25. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



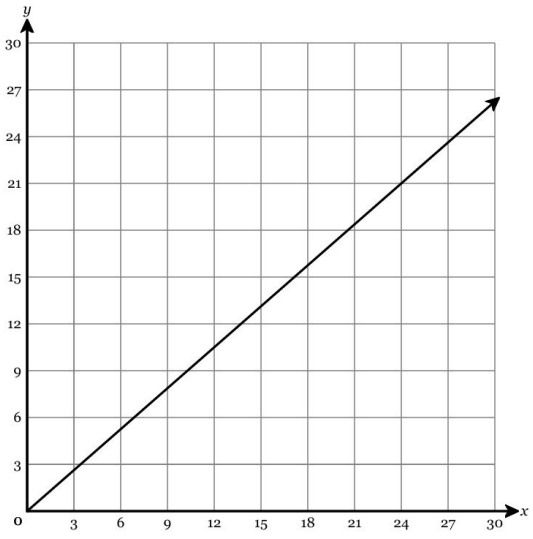
$$y = \frac{5}{7}x$$

26. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



$$y = \frac{7}{5}x$$

27. Find the equation that represents the proportional relationship in this graph, for y in terms of x.



$$y = \frac{7}{8}x$$

28. The table below shows that the number of miles driven by Lillian is directly proportional to the number of gallons she used.

Gallons Used	Miles Driven
29	539.4
47	874.2
50	930

If *m* represents the number of miles driven for any number of gallons used, *g*, write a proportional equation for *m* in terms of *g* that matches the context.

$$m = 18.6g$$

29. The proportional relationship between the number of sweaters a clothing store buys and sells, *s*, and the profit, in dollars and cents, that it makes off those sweaters, can be represented by the equation $p = 21s$. What is the profit in dollars and cents that the store makes per sweater?

$$\$21 \text{ per sweater}$$

30. The table below shows a proportional relationship between g and h.

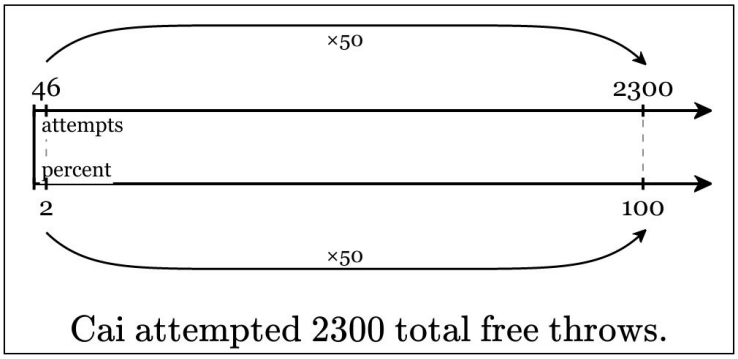
g	h
96	12
144	18
160	20

Write a proportional equation for *h* in terms of *g*. Use a whole number or **fraction**, not a decimal, in your equation.

$$h = \frac{1}{8}g$$

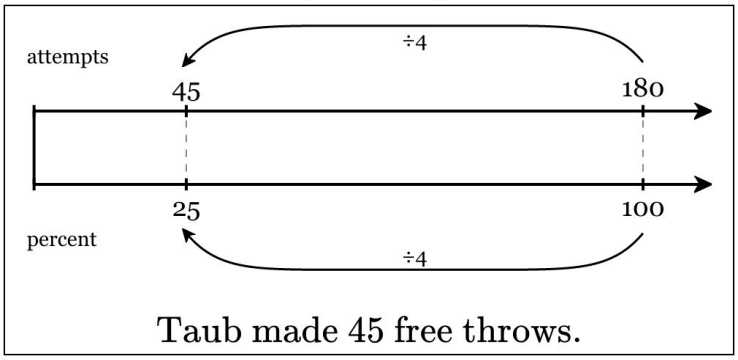
Using Percent

1. Cai misses 2% of the free throws he attempts in a season. How many total free throws did he attempt if he missed 46?



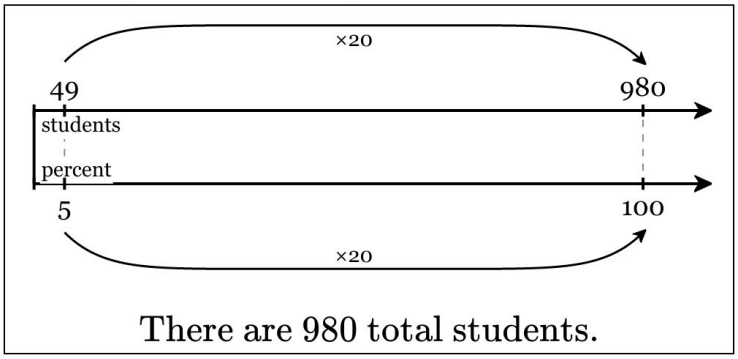
Cai attempted 2300 total free throws.

2. Taub made 25% of her free throws over the season. If she shot 180 free throws, how many did she make?



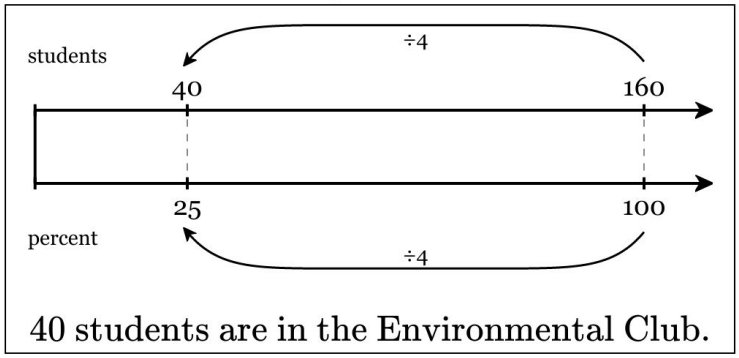
Taub made 45 free throws.

3. All students in Ridgewood Junior High School either get their lunch in the school cafeteria or brought it from home on Tuesday. 5% of students brought their lunch. 49 students brought their lunch. How many students in total are in Ridgewood Junior High School?



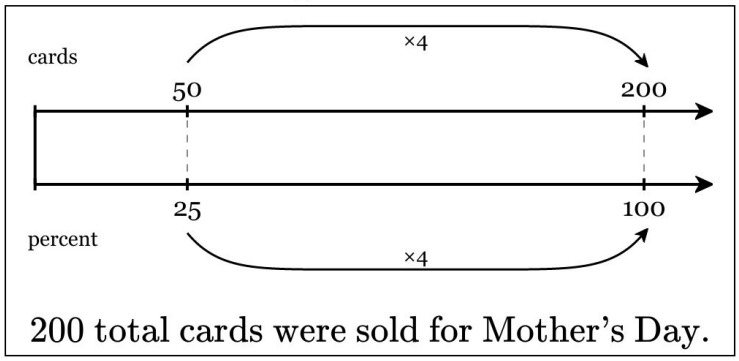
There are 980 total students.

4. There are 160 students in the seventh grade, and 25% are in the Environmental Club. How many students are in the Environmental Club? On the double number line below, fill in the values given in the problem then scale up or down to find the missing value.



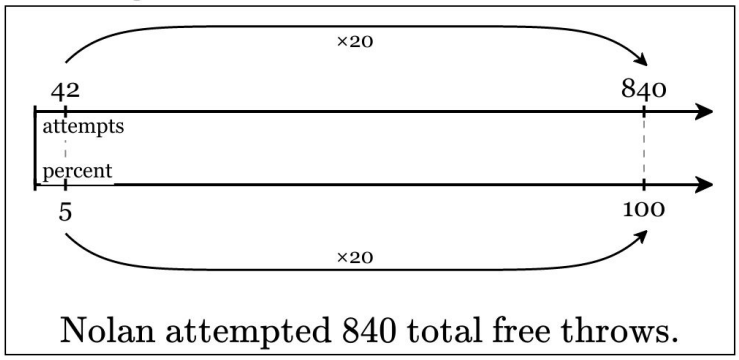
40 students are in the Environmental Club.

5. Bob's gift shop sold a record number of cards for Mother's Day. One salesman sold 50 cards, which was 25% of the cards sold for Mother's Day. How many cards were sold for Mother's Day? On the double number line below, fill in the values given in the problem then scale up or down to find the missing value.



200 total cards were sold for Mother's Day.

6. Nolan misses 5% of the free throws he attempts in a season. How many total free throws did he attempt if he missed 42? On the double number line below, fill in the values given in the problem then scale up or down to find the missing value.



Nolan attempted 840 total free throws.

Using Percent

7. At a football stadium, 20% of the fans in attendance were teenagers. If there were 20 teenagers at the football stadium, what was the total number of people at the stadium?

100

8. 400 students attend Ridgewood Junior High School. 4% of students bring their lunch to school everyday. How many students brought their lunch to school on Thursday?

16

9. All students in Ridgewood Junior High School either got their lunch in the school cafeteria or brought it from home on Tuesday. 25% of students brought their lunch. 37 students brought their lunch. How many students in total are in Ridgewood Junior High School?

148

10. What is 15% of 660?

99

11. 504 is what percent of 600?

84%

12. 429 is what percent of 650?

66%

13. 71.2 is what percent of 128? Round to the nearest hundredth.

55.63%

14. Find 112.1% of 186. Round to the nearest tenth.

208.5

15. Find 129.9% of 414. Round to the nearest hundredth.

537.79

Using Percent

16. A bakery sold a total of 60 cupcakes in a day, and 55% of them were mocha flavored. How many of the cupcakes sold that day were mocha flavored?

33

17. At a baseball game, 39% of people attending were supporting the home team, while 61% were supporting the visiting team. If 1053 people attending the game supported the home team, what was the total number of people attending the game?

2700

18. Jordan has a mask collection of 360 masks. He keeps 162 of the masks on his wall. What percentage of Jordan's mask collection does he keep on his wall?

45

19. Josue has a loyalty card good for a 18% discount at his local pharmacy. What number should he multiply the prices on the tags by to find the price he would have to pay, before tax, in one step?

0.82

20. Skylar went shopping for a new phone. Sales tax where she lives is 10%. What number should she multiply the price of the phone by to find the total plus tax in one step?

1.1

21. Gabriella invests money in an account paying a simple interest of 3% per year. If no money will be added or removed from the investment, what should she multiply her current balance by to find her total balance in a year in one step?

1.03

22. Arianys has a loyalty card good for a discount at her local grocery store. To find the total she has to pay, before tax, she multiplies the prices by 0.93. What percent discount does the card give?

7%

23. The population of a city decreases by 1.9% per year. What should we multiply the current population by to find next year's population in one step?

0.981

Using Percent

24. The population of a city increases by 1.4% per year. What should we multiply the current population by to find the next year's population in one step?

$\boxed{1.014}$

25. Tyler has a loyalty card good for a discount at his local pharmacy. The item he wants to buy is priced at $8, before discount and tax. After the discount, and before tax, the price is $6.88. Find the percent discount.

$\boxed{14\%}$

26. One year, the population of a city was 92,000. Several years later it was 105,800. Find the percent increase.

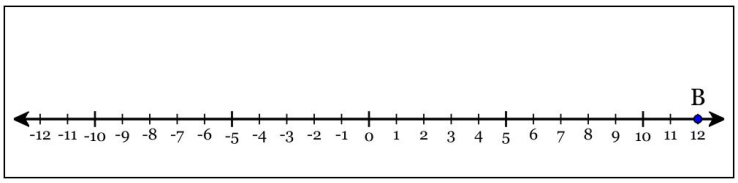
$\boxed{15\%}$

27. Xavier went shopping for a new camera. The listed price of the camera was $38, but the price with tax came to $39.14. Find the percent sales tax.

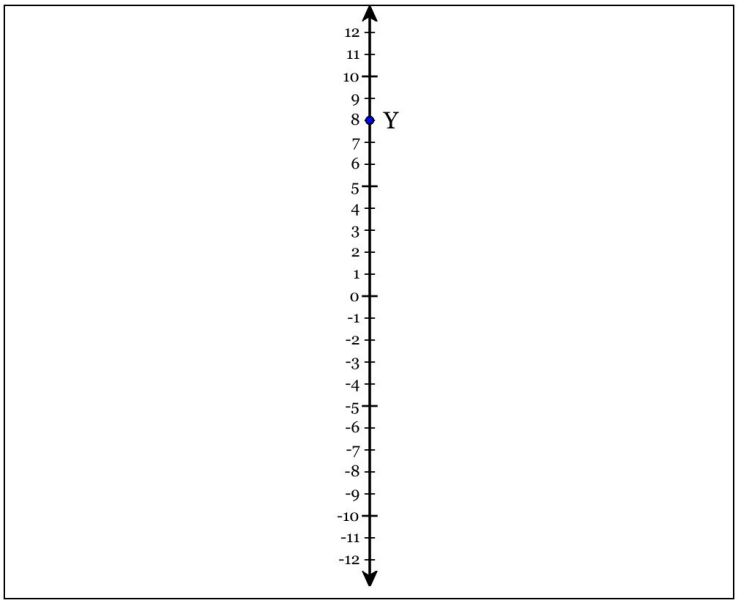
$\boxed{3\%}$

Signed Numbers

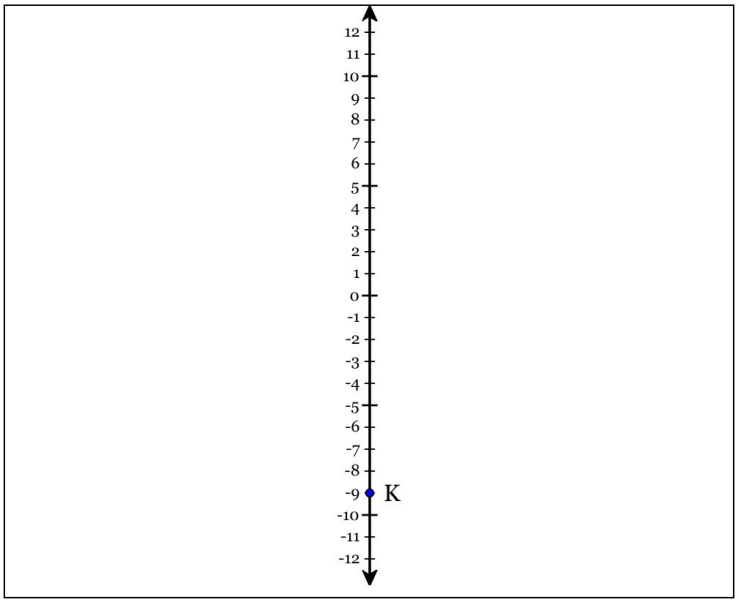
1. Point B is located at 12. Plot Point B on the number line below.



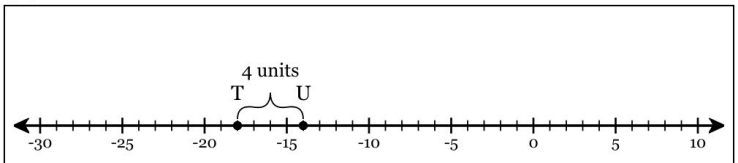
2. Point Y is located at 8. Plot Point Y on the number line below.



3. Point K is located at -9. Plot Point K on the number line below.

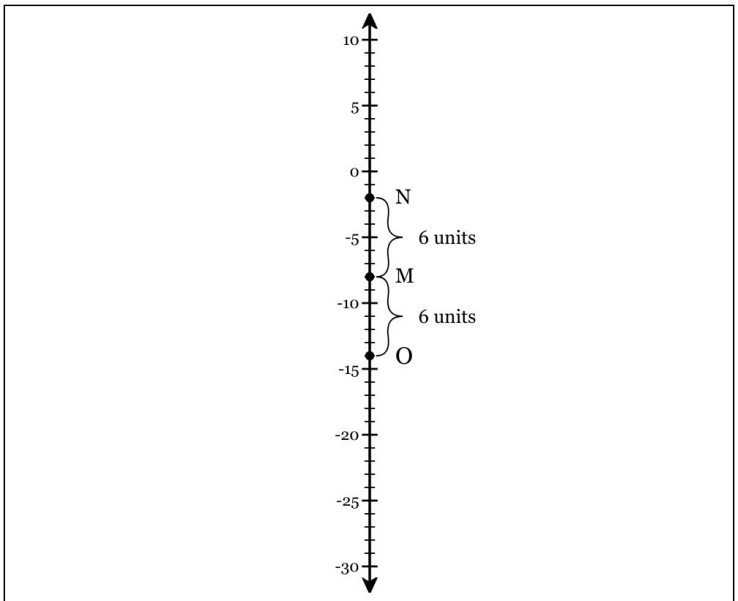


4. Point T is located at -18. Point U is 4 greater than point T. (a) Plot point U on the number line below.
(b) State where U is located.



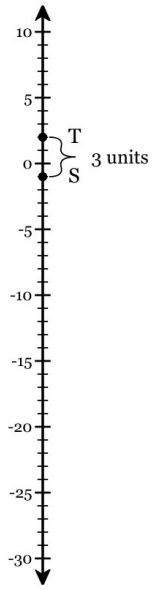
$U = -14$

5. Point M is located at -8. Points N and O are each 6 units away from point M. (a) Plot point N and point O on the number line below. (b) State where N and O are located.



$N = -2$ $O = -14$

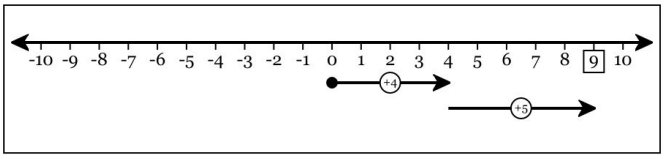
6. Point S is located at -1. Point T is 3 greater than point S. (a) Plot point T on the number line below. (b) State where T is located.



$T = 2$

7. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

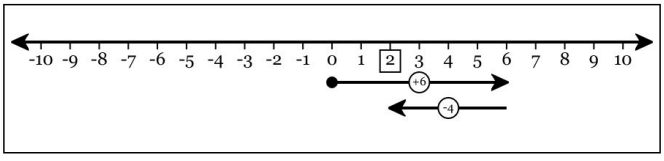
$4 + 5$



$\boxed{4 + 5 = \mathbf{9}}$

8. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

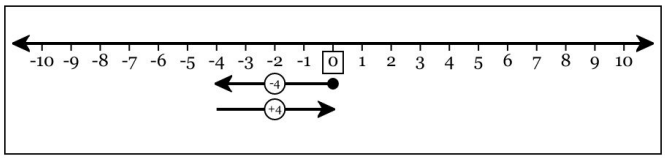
$6 - 4$



$\boxed{6 - 4 = \mathbf{2}}$

9. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

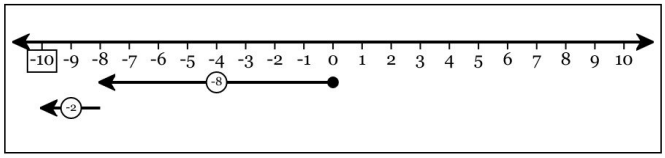
$-4 + 4$



$\boxed{-4 + 4 = \mathbf{0}}$

10. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

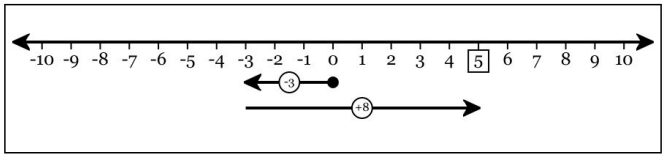
$-8 - 2$



$\boxed{-8 - 2 = \mathbf{-10}}$

11. Find the result graphically. Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

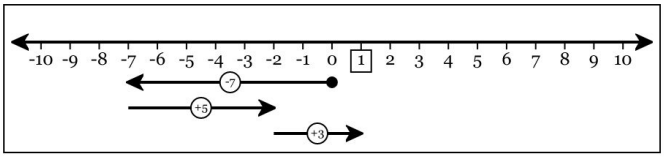
$-3 + 8$



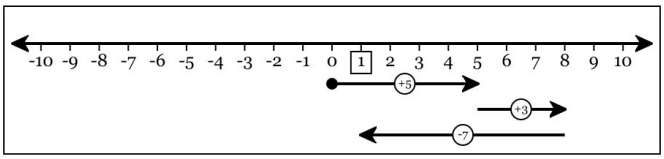
$\boxed{-3 + 8 = \mathbf{5}}$

12. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

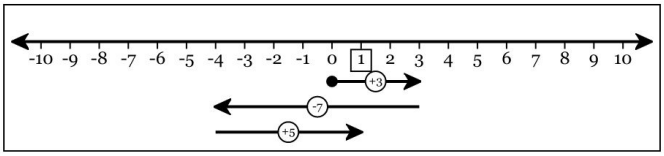
$$-7+5+3$$



Possible alternate order: $5+3-7$



Possible alternate order: $3-7+5$

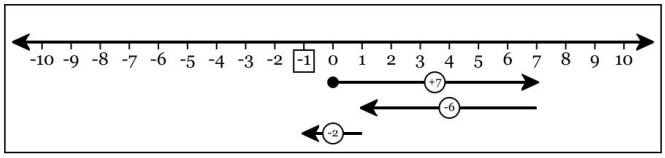


What final answer do all of these three diagrams give?

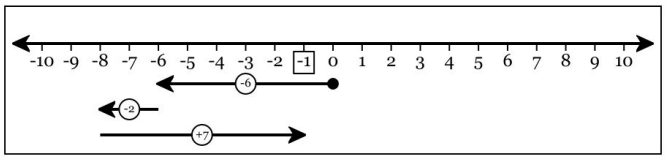
1

13. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

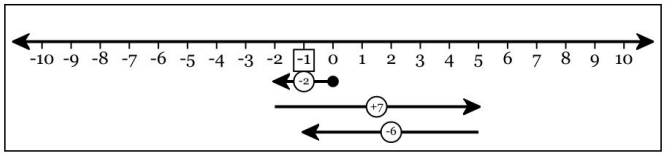
$$7-6-2$$



Possible alternate order: $-6-2+7$



Possible alternate order: $-2+7-6$



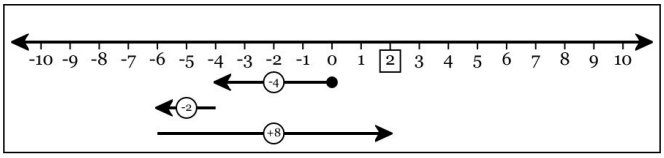
What final answer do all of these three diagrams give?

-1

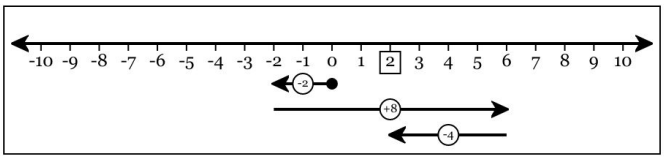
Signed Numbers

14. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

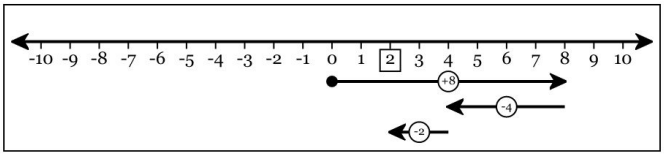
$$-4-2+8$$



Possible alternate order: $-2+8-4$



Possible alternate order: $8-4-2$

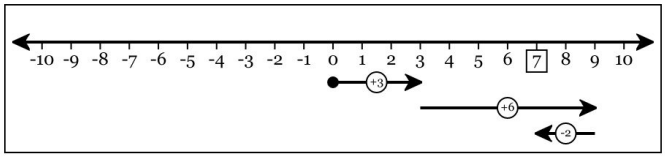


What final answer do all of these three diagrams give?

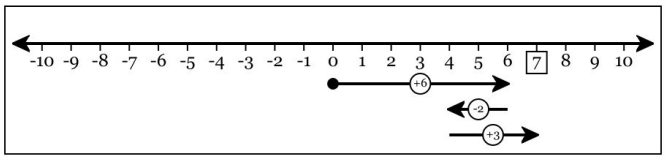
2

15. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

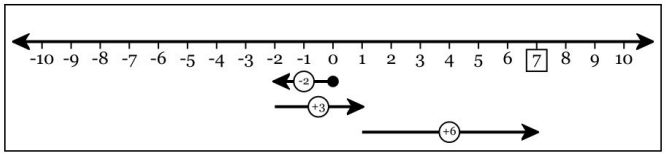
$$3+6-2$$



Possible alternate order: $6-2+3$



Possible alternate order: $-2+3+6$



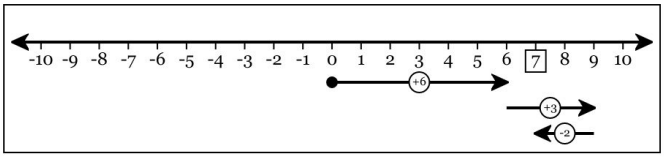
What final answer do all of these three diagrams give?

7

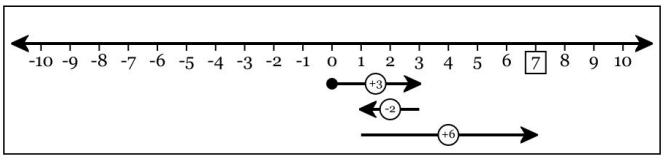
Signed Numbers

16. Find the result graphically in three different ways, using the commutative property of addition (that is, mix up the order of the numbers). Start from 0 and draw a series of jumps in a positive or negative direction to find the final answer.

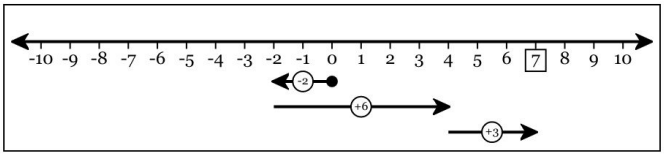
$$6 + 3 - 2$$



Possible alternate order: $3 - 2 + 6$



Possible alternate order: $-2 + 6 + 3$



What final answer do all of these three diagrams give?

$\boxed{7}$

17. Write the numbers below in order from least to greatest. Use commas to separate.

$\boxed{19}$ $\boxed{-2}$ $\boxed{-20}$ $\boxed{-6}$ $\boxed{-15}$ $\boxed{-14}$

$-20,\ -15,\ -14,\ -6,\ -2,\ 19$

18. Write the numbers below in order from least to greatest. Use commas to separate.

$\boxed{-16}$ $\boxed{-18}$ $\boxed{17}$ $\boxed{-9}$ $\boxed{6}$ $\boxed{-12}$

$-18,\ -16,\ -12,\ -9,\ 6,\ 17$

19. Write the numbers below in order from least to greatest. Use commas to separate.

$\boxed{-19}$ $\boxed{3}$ $\boxed{-3}$ $\boxed{11}$ $\boxed{-18}$ $\boxed{7}$

$-19,\ -18,\ -3,\ 3,\ 7,\ 11$

20. Write the numbers below in order from least to greatest. Use commas to separate.

$\boxed{-5.6}$ $\boxed{-16}$ $\boxed{-11.2}$ $\boxed{13.1}$ $\boxed{-15.6}$ $\boxed{-5.2}$

$-16,\ -15.6,\ -11.2,\ -5.6,\ -5.2,\ 13.1$

21. Write the numbers below in order from least to greatest. Use commas to separate.

$\boxed{-4.7}$ $\boxed{-0.8}$ $\boxed{-0.4}$ $\boxed{4.8}$ $\boxed{-12.8}$ $\boxed{-19.4}$

$-19.4,\ -12.8,\ -4.7,\ -0.8,\ -0.4,\ 4.8$

22. Write the numbers below in order from least to greatest. Use commas to separate.

$\boxed{-5.4}$ $\boxed{4.4}$ $\boxed{-7.8}$ $\boxed{-15.2}$ $\boxed{-14.8}$ $\boxed{-3.5}$

$-15.2,\ -14.8,\ -7.8,\ -5.4,\ -3.5,\ 4.4$

23. Write the numbers below in order from least to greatest. Use commas to separate.

$\boxed{0.65}$ $\boxed{-1.96}$ $\boxed{-1.47}$ $\boxed{-1.2}$ $\boxed{-1.71}$ $\boxed{0.68}$

$-1.96,\ -1.71,\ -1.47,\ -1.2,\ 0.65,\ 0.68$

Signed Numbers

24. Write the numbers below in order from least to greatest. Use commas to separate.

-0.63 | 1.55 | 0.9 | -0.19 | -0.01 | -0.66

$-0.66,\ -0.63,\ -0.19,\ -0.01,\ 0.9,\ 1.55$

25. Write the numbers below in order from least to greatest. Use commas to separate.

1.57 | -1.9 | 0.87 | -1.93 | -1.15 | 1.11

$-1.93,\ -1.9,\ -1.15,\ 0.87,\ 1.11,\ 1.57$

26. Which expression is equivalent to $-38.3 - 95.2$?

A. $-95.2 - (-38.3)$

B. $95.2 - (-38.3)$

C. $-38.3 - (-95.2)$

D. $-38.3 + (-95.2)$

27. Which expression has the same value as $10\frac{1}{5} + 7\frac{2}{3}$?

A. $10\frac{1}{5} - (-7\frac{2}{3})$

B. $7\frac{2}{3} + (-10\frac{1}{5})$

C. $10\frac{1}{5} - 7\frac{2}{3}$

D. $-7\frac{2}{3} - 10\frac{1}{5}$

28. Which expression has the same value as $-2x - 5y$?

A. $-2x + (-5y)$

B. $2x + (-5y)$

C. $5y - (-2x)$

D. $-5y - (-2x)$

29. Which expression is equivalent to $-5 + (-7)$?

A. $7 - (-5)$

B. $-7 - (-5)$

C. $-7 + 5$

D. $-5 - 7$

30. Which expression is equivalent to $-3 - 6$?

A. $-6 + 3$

B. $6 - (-3)$

C. $-6 - (-3)$

D. $-3 + (-6)$

31. Which expression is equivalent to $-3.2 + (-80.3)$?

A. $-80.3 - (-3.2)$

B. $3.2 - (-80.3)$

C. $-80.3 - 3.2$

D. $80.3 + (-3.2)$

32. Which expression is equivalent to $-8 - 10$?

A. $-10 + 8$

B. $8 + (-10)$

C. $-10 + (-8)$

D. $-10 - (-8)$

33. Which expression is equivalent to $-1\frac{1}{5} - (-7\frac{3}{4})$?

A. $7\frac{3}{4} + 1\frac{1}{5}$

B. $-1\frac{1}{5} + 7\frac{3}{4}$

C. $7\frac{3}{4} - (-1\frac{1}{5})$

D. $1\frac{1}{5} + 7\frac{3}{4}$

34. Which expression has the same value as $10 + (-4)$?

A. $10 - 4$

B. $-4 + (-10)$

C. $4 - 10$

D. $10 - (-4)$

35. Which expression has the same value as $-6y + (-6x)$?

A. $-6x - (-6y)$

B. $-6x - 6y$

C. $-6y - (-6x)$

D. $-6y + 6x$

Algebraic Expressions

1. What is the value of the expression $5y - 7$ when $y = 9$?

$\boxed{38}$

2. What is the value of the expression $8z^2 - 10z - 6$ when $z = 3$?

$\boxed{36}$

3. What is the value of the expression $5x - 4y$ when $x = 8$ and $y = 5$?

$\boxed{20}$

4. Combine like terms.

$$5y - 5y^2 - 5 + 2 + 2y + 3y^2 - 1$$

$\boxed{7y - 2y^2 - 4}$

5. Combine like terms.

$$5x^2 + 4 + 6y - 1 + 3y - 4x^2 - 5$$

$\boxed{x^2 - 2 + 9y}$

6. Combine like terms.

$$6x^3 + 5y^3 + 4 + y^3 + 6 + x^3 - 3x^3$$

$\boxed{4x^3 + 6y^3 + 10}$

7. Which expression is equivalent to $-6 + h - 9h$?

A. $-14h$ B. $-5 - 9h$

C. $-16h$ $\boxed{\text{D. } -8h - 6}$

8. Which expression is equivalent to $-3a + 1 - 9a - 10$?

A. -21 B. $-21a$

$\boxed{\text{C. } -12a - 9}$ D. $-2a - 19$

Algebraic Expressions

9. The width of a rectangle measures $(6d + 9)$ centimeters, and its length measures $(5d - 8)$ centimeters. Which expression represents the perimeter, in centimeters, of the rectangle?

A. $2 + 22d$ B. $15d - 3$

C. $30d - 6$ D. $11d + 1$

10. Which expression is equivalent to $9r + r - r$?

A. $9r$ B. $1 + 8r$

C. $-11r$ D. $r + 8$

11. The width of a rectangle measures $(6m + 2n)$ centimeters, and its length measures $(9m - 9n)$ centimeters. Which expression represents the perimeter, in centimeters, of the rectangle?

A. $30m + 2 - 18n$ B. $30m - 14$

C. $30m - 14n$ D. $15m - 7$

12. A triangle has side lengths of $(3.1s + 2.5t)$ centimeters, $(4.6s + 5.2u)$ centimeters, and $(8.4u - 8.9t)$ centimeters. Which expression represents the perimeter, in centimeters, of the triangle?

A. $7.7s - 6.4t + 13.6u$

B. $16.1su - 1.2tu$

C. $-0.5u + 7.7s + 7.7t$

D. $5.6st + 9.8su - 0.5tu$

13. The width of a rectangle measures $(4.2m - 1.2n)$ centimeters, and its length measures $(8.4m - 5.5n)$ centimeters. Which expression represents the perimeter, in centimeters, of the rectangle?

A. $25.2m - 11n - 1.2$ B. $-13.4 + 25.2m$

C. $-13.4n + 25.2m$ D. $-6.7 + 12.6m$

14. Which expression is equivalent to $0.32t + t - 0.53$?

A. $0.79t$ B. $1.32t - 0.53$

C. $-1.21t$ D. $0.32t + 0.47$

15. Which expression is equivalent to $0.83v + v - 0.69v$?

A. $1.14v$ B. $-0.52v$

C. $1 + 0.14v$ D. $v + 0.14$

16. Which expression is equivalent to $4.3w + 4.2 + 2.9w - 1.7$?

A. $1.4w + 2.5$ B. $2.5 + 7.2w$

C. $1.4w + 5.9$ D. $8.5w + 1.2$

17. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$-(-0.9m + 5n) - 2$$

$$0.9m - 5n - 2$$

18. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$-(-7w + 2.4x - 6)$$

$$7w - 2.4x + 6$$

19. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$-(-8.7x - 9)$$

$$8.7x + 9$$

20. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$0.6f - (-2g + 1)$$

$$0.6f + 2g - 1$$

21. Write an equivalent expression by distributing the "−" sign outside the parentheses:

$$-(-6p - 9.2q - 2.3)$$

$$6p + 9.2q + 2.3$$

22. Use the distributive property to write an equivalent expression.

$$4(v + 2w)$$

$$4v + 8w$$

23. Use the distributive property to write an equivalent expression.

$$5(6x + 3y - 6)$$

$$30x + 15y - 30$$

24. Use the distributive property to write an equivalent expression.

$$7(6s - 7t + 4)$$

$$42s - 49t + 28$$

25. Use the distributive property to write an equivalent expression.

$$8(8p + 10)$$

$$64p + 80$$

26. Use the distributive property to write an equivalent expression.

$$3(s - 10t + 1)$$

$$3s - 30t + 3$$

27. Rewrite in simplest terms: $8(-6f - 8) + 5f$

$$-43f - 64$$

Algebraic Expressions

28. Rewrite in simplest terms:
$-9(4n-3)-3(-n-8)$

$\boxed{-33n+51}$

29. Rewrite in simplest terms: $-6a-8(2a-1)$

$\boxed{-22a+8}$

30. Rewrite in simplest terms:
$-5(-7r-8r-3)-9r$

$\boxed{66r+15}$

31. Rewrite in simplest terms:
$-10(-10g+3h)-9h-2(-10h-10g)$

$\boxed{120g-19h}$

32. Which expression is equivalent to the expression below?

$$5(6v+6)-7v$$

A. $37v+6$ B. $5(6v+6-7v)$

C. $18v+11$ $\boxed{\text{D. } 23v+30}$

33. Which expression is equivalent to the expression below?

$$f+f+f+f+f+f+f+g+g+g$$

A. f^7g^3 B. $10fg$

C. $\frac{f}{7}+\frac{g}{3}$ $\boxed{\text{D. } 7f+3g}$

34. Which expression is equivalent to the expression below?

$$w+w+w+w+w$$

$\boxed{\text{A. } 5w}$ B. 5 C. $\frac{w}{5}$ D. w^5

35. Which pair of expressions below are equivalent?

A. $6r+3r$ and $9r^2$

$\boxed{\text{B. } 6(3r-8) \text{ and } 18r-48}$

C. $6r-3s$ and $3s-6r$

D. $6(3r-8)$ and $18r-8$

Algebraic Expressions

36. Which expression is equivalent to the expression below?

$$6(7t) + 3t$$

A. $25t$

B. $42t + 7t^2$

C. $10t + 6$

D. $45t$

Solving Equations

1. Find the value of x in the equation below.

$$30 = 3x$$

$\boxed{x = 10}$

2. Find the value of x in the equation below.

$$17 = x + 1$$

$\boxed{x = 16}$

3. Find the value of x in the equation below.

$$7 = x - 9$$

$\boxed{x = 16}$

4. Find the value of x in the equation below.

$$8 = \frac{x}{8}$$

$\boxed{x = 64}$

5. Find the value of x in the equation below.

$$2 = \frac{x}{5}$$

$\boxed{x = 10}$

6. Find the value of x in the equation below.

$$x - 15.3 = 8.1$$

$\boxed{x = 23.4}$

7. Find the value of x in the equation below.

$$2x = 12.8$$

$\boxed{x = 6.4}$

8. Find the value of x in the equation below.

$$2.9 = \frac{x}{5}$$

$\boxed{x = 14.5}$

9. Find the value of x in the equation below.

$$13 = x + 10.2$$

$\boxed{x = 2.8}$

10. Find the value of x in the equation below.

$$x + 1 = 5.5$$

$\boxed{x = 4.5}$

11. Solve for a.

$$a - 6 = -9$$

$\boxed{a = -3}$

12. Solve for c.

$$4 = c + 10$$

$\boxed{c = -6}$

Solving Equations

13. Solve for y.

$$-2 = -10 + y$$

$$\boxed{y = 8}$$

14. Solve for t.

$$8 + t = 7$$

$$\boxed{t = -1}$$

15. Solve for n.

$$7 = n - 2$$

$$\boxed{n = 9}$$

16. Solve for y.

$$-60 = 12y$$

$$\boxed{y = -5}$$

17. Solve for s.

$$48 = 8s$$

$$\boxed{s = 6}$$

18. Solve for t.

$$60 = 12t$$

$$\boxed{t = 5}$$

19. Solve for n.

$$30 = -10n$$

$$\boxed{n = -3}$$

20. Solve for s.

$$-20 = 10s$$

$$\boxed{s = -2}$$

21. Solve for n.

$$-3 = \frac{n}{-8}$$

$$\boxed{n = 24}$$

22. Solve for s.

$$8 = \frac{s}{7}$$

$$\boxed{s = 56}$$

23. Solve for s.

$$\frac{s}{-8} = -5$$

$$\boxed{s = 40}$$

24. Solve for r.

$$9 = \frac{r}{-7}$$

$$\boxed{r = -63}$$

Solving Equations

25. Solve for b.

$$\frac{b}{-8} = -2$$

$$\boxed{b = 16}$$

26. Solve for n and simplify your answer.

$$-\frac{5}{3}n = -10$$

$$\boxed{n = 6}$$

27. Solve for s and simplify your answer.

$$-3 = \frac{5}{2}s$$

$$\boxed{-\frac{6}{5} = s}$$

28. Solve for r and simplify your answer.

$$10 = -\frac{6}{5}r$$

$$\boxed{-\frac{25}{3} = r}$$

29. Solve for w and simplify your answer.

$$-\frac{3}{2}w = 7$$

$$\boxed{w = -\frac{14}{3}}$$

30. Solve for w and simplify your answer.

$$\frac{4}{3}w = -8$$

$$\boxed{w = -6}$$

31. Solve for c.

$$8 = -3c + 29$$

$$\boxed{c = 7}$$

32. Solve for b.

$$14 - \frac{b}{8} = 17$$

$$\boxed{b = -24}$$

33. Solve for a.

$$-56 = 5a - 11$$

$$\boxed{a = -9}$$

Solving Equations

34. Solve for b.

$$7b + 2 = 23$$

$\boxed{b = 3}$

35. Solve for b.

$$6b - 11 = -23$$

$\boxed{b = -2}$

36. Solve for a.

$$-\frac{a}{0.2} + 0.7 = 17.2$$

$\boxed{a = -3.3}$

37. Solve for b.

$$1.5 - 0.8b = -1.38$$

$\boxed{b = 3.6}$

38. Solve for a.

$$-3.64 = -0.7 - 2.1a$$

$\boxed{a = 1.4}$

39. Solve for a.

$$0.4a + 0.4 = -0.92$$

$\boxed{a = -3.3}$

40. Solve for z.

$$-10.35 = -2.6 + \frac{z}{0.4}$$

$\boxed{z = -3.1}$

41. Solve for z.

$$1 + \frac{1}{7}z = 6$$

$\boxed{z = 35}$

Solving Equations

42. Solve for c.

$$6 = -15 + \frac{3}{7}c$$

$\boxed{c = 49}$

43. Solve for b.

$$16 = 12 + \frac{1}{5}b$$

$\boxed{b = 20}$

44. Solve for b.

$$39 = 15 + \frac{1}{2}b$$

$\boxed{b = 48}$

45. Solve for z.

$$53 = -\frac{4}{7}z + 17$$

$\boxed{z = -63}$

46. Solve. $3(2x - 1) = 3$

$\boxed{x = 1}$

47. Solve. $3(5x - 7) = 9$

$\boxed{x = 2}$

48. Solve. $3(2y - 7) = 9$

$\boxed{y = 5}$

49. Solve. $2(2x + 8) = 24$

$\boxed{x = 2}$

Solving Equations

50. Solve. $5(y+3)=25$

$\boxed{y=2}$

51. Which equation has the solution $x=6$?

A. $6x+3=30$

B. $2x+9=39$

C. $\boxed{5x-8=22}$

D. $6x+6=-42$

52. What value of x makes the equation below true?

$$2x+7=13$$

A. $\boxed{3}$ B. 7 C. 10 D. 16

53. Which equation has the solution $x=8$?

A. $\boxed{9x+9=81}$

B. $5x-3=41$

C. $5x+2=67$

D. $8x+1=-65$

54. What value of z makes the equation below true?

$$9z-1=53$$

A. 1 B. 2 C. $\boxed{6}$ D. 10

55. What value of w makes the equation below true?

$$4w-4=8$$

A. 1 B. $\boxed{3}$ C. 4 D. 15

Equations in Context

1. Under her cell phone plan, Skylar pays a flat cost of $50 per month and $3 per gigabyte. She wants to keep her bill at $60.20 per month. How many gigabytes of data can she use while staying within her budget?

She can use 3.4 gigabytes.

2. Dianelys has a points card for a movie theater.

- She receives 25 rewards points just for signing up.
- She earns 10.5 points for each visit to the movie theater.
- She needs 88 points for a free movie ticket.

How many visits must Dianelys make to earn a free movie ticket?

She must make 6 visits.

3. Adam buys cheese and onions at the store.

- He pays a total of $37.96.
- He pays a total of $5.06 for the cheese.
- He buys 5 bags of onions that each cost the same amount.

How much does each bag of onions cost?

Each bag of onions costs $6.58.

4. Paisley wants to ride her bicycle 23.5 miles this week. She has already ridden 7 miles. If she rides for 5 more days, what is the average number of miles she would have to ride each day to meet her goal?

She would have to ride 3.3 miles per day.

5. Members of a soccer team raised $1673.50 to go to a tournament. They rented a bus for $869.50 and budgeted $50.25 per player for meals. Determine the number of players the team can bring to the tournament.

The team can bring 16 players to the tournament.

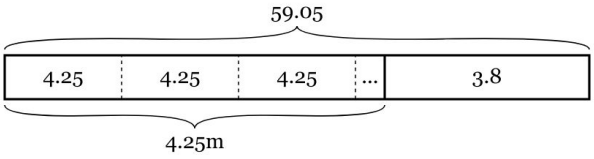
Equations in Context

6. Jacob took a taxi from his house to the airport. The taxi company charged a pick-up fee of $3.80 plus $4.25 per mile. The total fare was $63.30, not including the tip. Which equation or tape diagram could be used to represent the context if m represents the number of miles in the taxi ride?

A

$$3.8m + 4.25 = 63.3$$

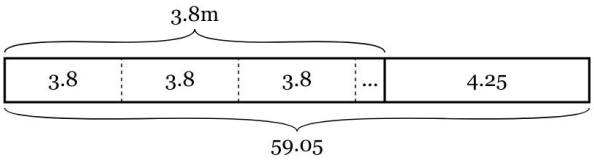
B



C

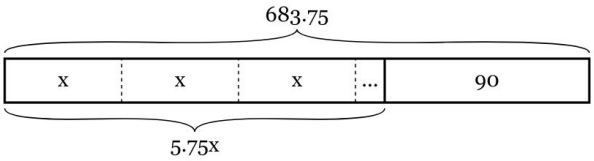
$$4.25m = 63.3 - 3.8$$

D

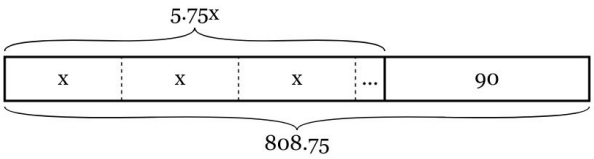


7. Sadie needed to get her computer fixed. She took it to the repair store. The technician at the store worked on the computer for 5.75 hours and charged her $90 for parts. The total was $808.75. Which equation or tape diagram could be used to represent the context if x represents the cost of labor per hour?

A



B



C

$$x = \frac{808.75 - 5.75}{90}$$

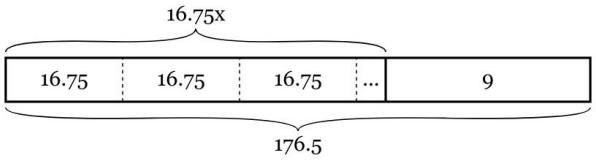
D

$$808.75 = 90x + 5.75$$

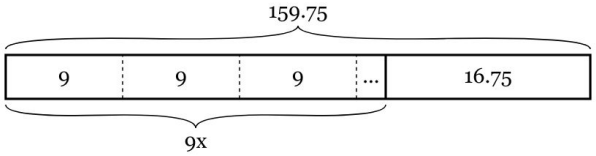
Equations in Context

8. A group of friends wants to go to the amusement park. They have \$176.50 to spend on parking and admission. Parking is \$9, and tickets cost \$16.75 per person, including tax. Which tape diagram could be used to represent the context if x represents the number of people who can go to the amusement park?

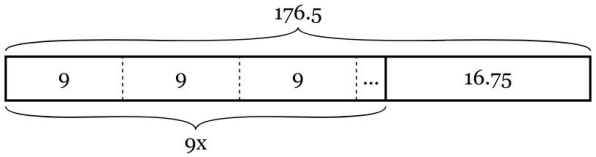
A



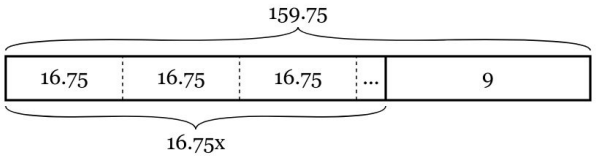
B



C



D



9. Connor buys cheese and potatoes at the store.

- He pays a total of \$31.30.
- He pays \$2.68 for the cheese.
- He buys 6 bags of potatoes that each cost the same amount.

Which equation could be used to determine x, how much each bag of potatoes costs?

A. $x = \frac{2.68-31.3}{6}$

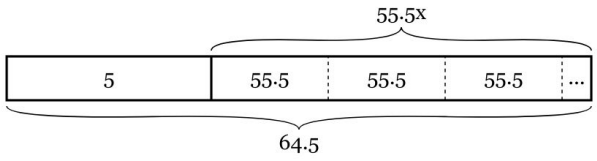
B. $31.3 = 6(x + 2.68)$

C. $6x + 2.68 = 31.3$

D. $x = \frac{31.3-6}{2.68}$

10. Under his cell phone plan, Ayden pays a flat cost of \$55.50 per month and \$5 per gigabyte. He wants to keep his bill at \$69.50 per month. Which equation or tape diagram could be used to represent the context if x represents the number of gigabytes of data Ayden can use while staying within his budget?

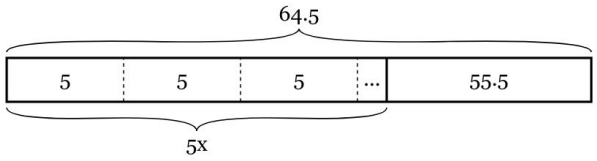
A



B

$$5x + 55.5 = 69.5$$

C

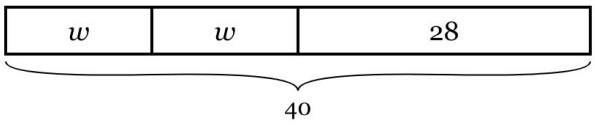


D

$$5(55.5 + x) = 69.5$$

Equations in Context

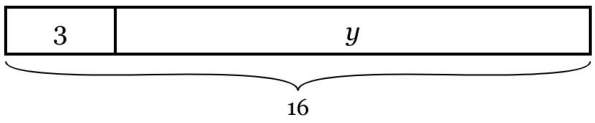
11. Which of the following equations corresponds to the diagram below?



A. $40 \div 28 = w$ **B. $2w + 28 = 40$**

C. $28 + w = 40$ D. $40 \div 28 = 2w$

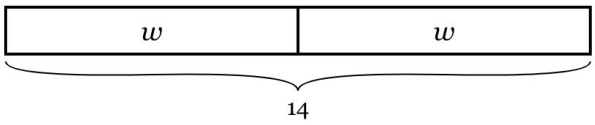
12. Which of the following equations corresponds to the diagram below?



A. $3y = 16$ B. $16y = 3$

C. $y + 16 = 3$ **D. $3 + y = 16$**

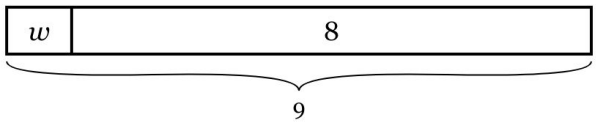
13. Which of the following equations corresponds to the diagram below?



A. $2 - w = 14$ **B. $w + w = 14$**

C. $w \div 2 = 14$ D. $2 \div w = 14$

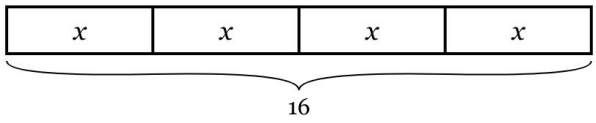
14. Which of the following equations corresponds to the diagram below?



A. $9w = 8$ **B. $8 + w = 9$**

C. $w - 8 = 9$ D. $8w = 9$

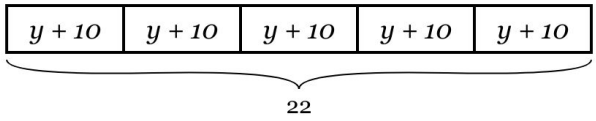
15. Which of the following equations corresponds to the diagram below?



A. $4x = 16$ B. $4 + 16x = 20$

C. $4 \div x = 16$ D. $16x = 4$

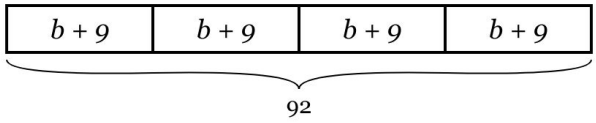
16. Which of the following equations corresponds to the diagram?



A. $10 + 5y = 22$ B. $22(y + 10) = 5$

C. $22 = y + 10$ **D. $5(y + 10) = 22$**

17. Which of the following equations corresponds to the diagram?

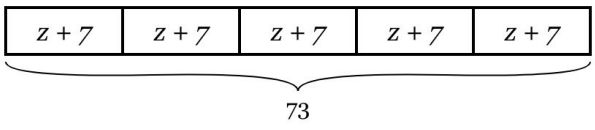


A. $b + 36 = 92$ B. $92 = 36b$

C. $92b + 9 = 4$ **D. $23 = b + 9$**

Equations in Context

18. Which of the following equations corresponds to the diagram?



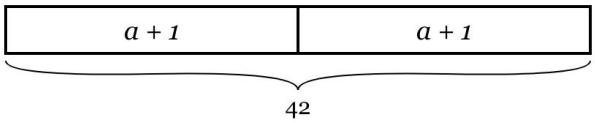
A. $73 = 5(z + 7)$

B. $73z = 7$

C. $73(z + 7) = 5$

D. $73z + 7 = 5$

19. Which of the following equations corresponds to the diagram?



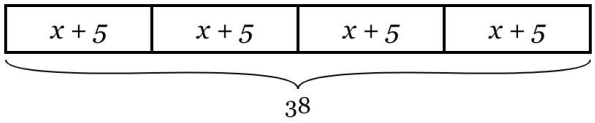
A. $a + 1 = 42$

B. $a + 2 = 42$

C. $42 = 2a + 2$

D. $1 + 2a = 42$

20. Which of the following equations corresponds to the diagram?



A. $4 = 5 + 38x$

B. $38 = 4(x + 5)$

C. $5 = 38x$

D. $38(x + 5) = 4$

21. Camila bought snacks for her team's practice. She bought a bag of chips for \$3.04 and a 15-pack of juice bottles. The total cost before tax was \$31.54. Write and solve an equation which can be used to determine j, how much each bottle of juice cost.

Answer: $j = 1.9$

22. Arun buys cheese and oranges at the store.

- He pays a total of \$47.94.
- He pays a total of \$5.03 for the cheese.
- He buys 7 bags of oranges that each cost the same amount.

Write and solve an equation which can be used to determine x, how much each bag of oranges costs.

Answer: $x = 6.13$

23. Members of a baseball team raised \$2007.50 to go to a tournament. They rented a bus for \$1191.50 and budgeted \$68 per player for meals. Write and solve an equation which can be used to determine x, the number of players the team can bring to the tournament.

Answer: $x = 12$

24. Amelia took a taxi from her house to the airport. The taxi company charged a pick-up fee of \$3.60 plus \$1 per mile. The total fare was \$25.60, not including the tip. Write and solve an equation which can be used to determine m, the number of miles in the taxi ride.

Answer: $m = 22$

Equations in Context

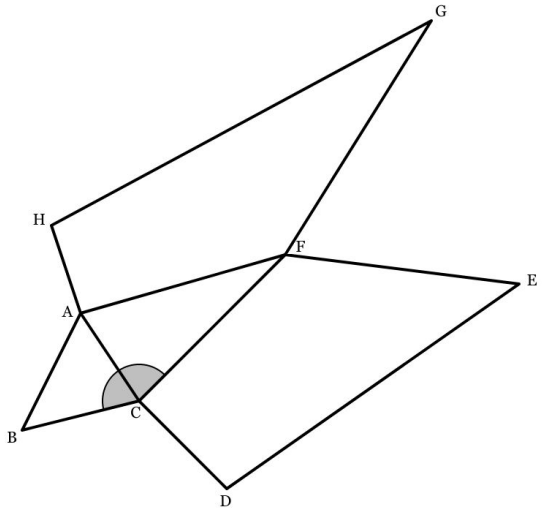
25. Under his cell phone plan, Jai pays a flat cost of $69.50 per month and $3 per gigabyte. He wants to keep his bill at $72.80 per month. Write and solve an equation which can be used to determine x, the number of gigabytes of data Jai can use while staying within his budget.

Answer: $x = 1.1$

Geometry Review

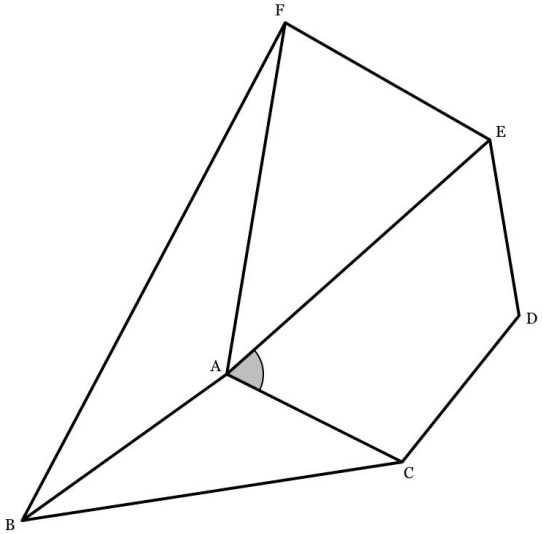
1. Identify $\angle BCF$ by by marking it with an arc on the diagram.

Correct Answer: Outline $\angle BCF$



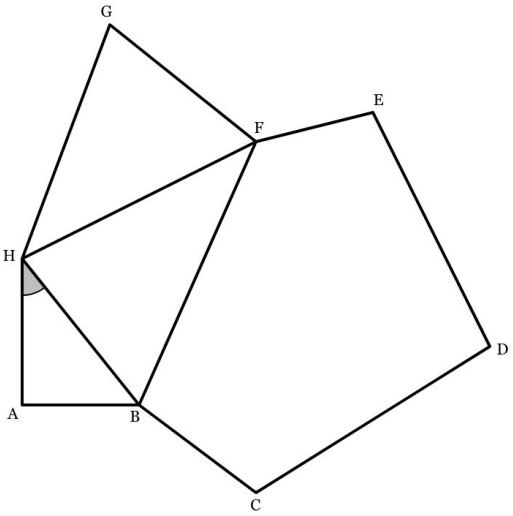
2. Identify $\angle EAC$ by by marking it with an arc on the diagram.

Correct Answer: Outline $\angle EAC$

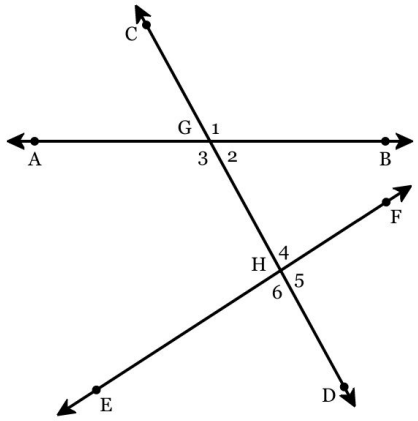


3. Identify $\angle BHA$ by by marking it with an arc on the diagram.

Correct Answer: Outline $\angle BHA$

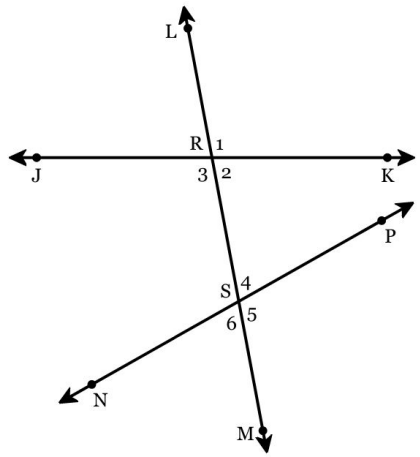


4. Which angle number represents an angle vertical to $\angle AGD$?



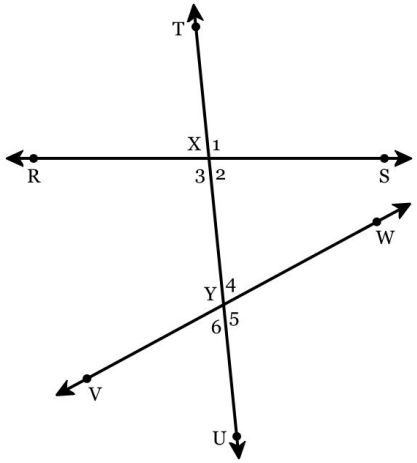
Angle number 1 is vertical to $\angle AGD$.

5. Which angle number represents an angle adjacent to $\angle NSM$?



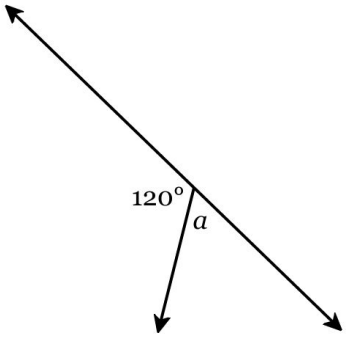
Angle number 5 is adjacent to $\angle NSM$.

6. If $\text{m}\angle VYU = 67°$, then what is $\text{m}\angle TYW$?



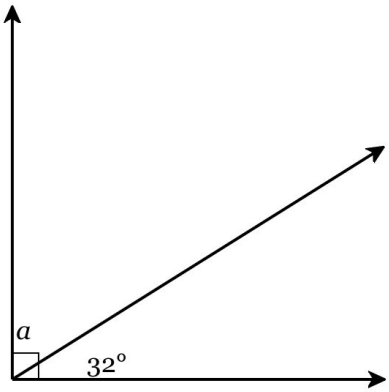
$\text{m}\angle TYW = 67°$

7. Find the measure of the missing angle.



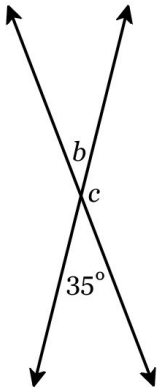
$a = 60°$

8. Find the measure of the missing angle.



$a = 58^\circ$

9. Find the measure of the missing angles.



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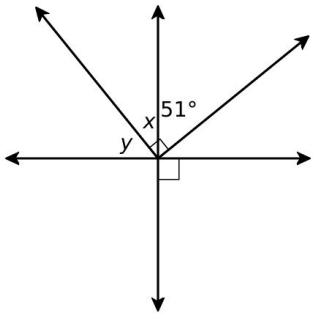
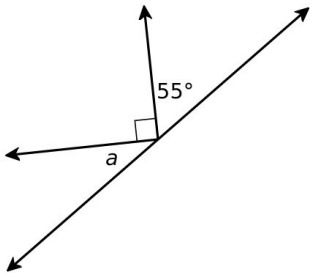
10. Find the degree measures x and y of the missing angles in the diagram below.



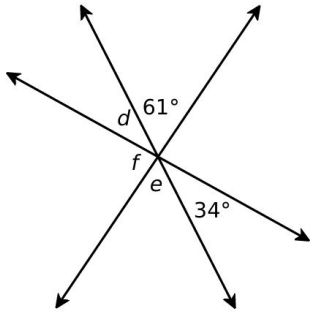
$x = 39^\circ \qquad y = 51^\circ$

11. Find the degree measure a of the missing angle in the diagram below.



$a = 35^\circ$

12. Find the degree measures d, e, and f of the missing angles in the diagram below.



$d = 34^\circ \qquad e = 61^\circ \qquad f = 85^\circ$

13. The radius of a circle is 17 ft. Find its circumference in terms of π.

$C = 34\pi \text{ ft}$

14. The diameter of a circle is 9 ft. Find its circumference in terms of π.

$C = 9\pi \text{ ft}$

15. The diameter of a circle is 16 ft. Find its circumference in terms of π.

$\boxed{C = 16\pi \text{ ft}}$

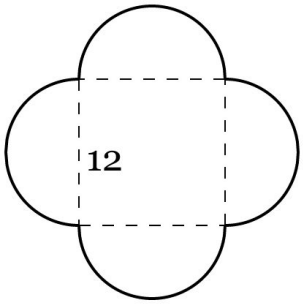
16. The radius of a circle is 10.9 ft. Find the circumference *to the nearest tenth.*

$\boxed{C = 68.5 \text{ ft}}$

17. The diameter of a circle is 13 in. Find the circumference *to the nearest tenth.*

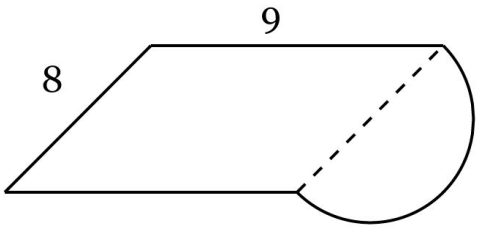
$\boxed{C = 40.8 \text{ in}}$

18. Find the Perimeter of the figure below, composed of a square and four semicircles. *Rounded to the nearest tenths place*



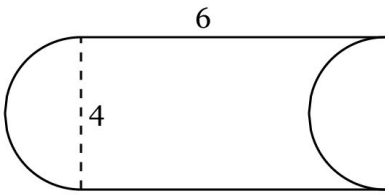
$\boxed{75.4}$

19. Find the Perimeter of the figure below, composed of a parallelogram and one semicircle. *Rounded to the nearest tenths place*



$\boxed{38.6}$

20. Find the Perimeter of the figure below, composed of a rectangle and two semicircles. *Round to the nearest tenths place*.



$\boxed{24.6}$

21. The diameter of a circle is 18 cm. Find its area in terms of π.

$\boxed{A = 81\pi \text{ cm}^2}$

22. The radius of a circle is 20 in. Find its area in terms of π.

$\boxed{A = 400\pi \text{ in}^2}$

23. The diameter of a circle is 12 in. Find its area in terms of π.

$\boxed{A = 36\pi \text{ in}^2}$

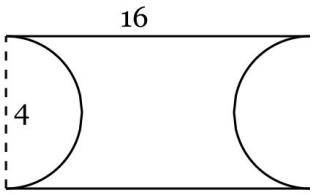
24. The radius of a circle is 21 m. Find its area *to the nearest whole number*.

$\boxed{A = 1385 \text{ m}^2}$

25. The diameter of a circle is 14 m. Find its area *to the nearest whole number*.

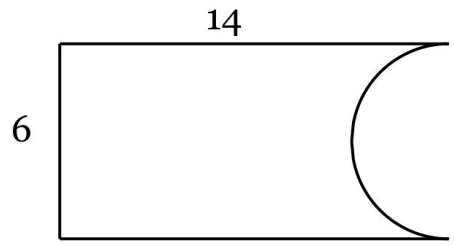
$\boxed{A = 154 \text{ m}^2}$

26. Find the Area of the figure below, composed of a rectangle with two semicircles removed. *Round to the nearest tenths place*.



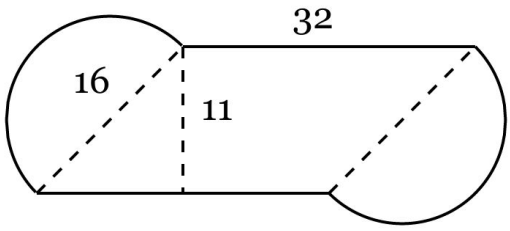
$\boxed{51.4}$

27. Find the Area of the figure below, composed of a rectangle with a semicircle removed from it. *Round to the nearest tenths place*.



$\boxed{69.9}$

28. Find the Area of the figure below, composed of a parallelogram and two semicircles. *Round to the nearest tenths place*.



$\boxed{553.1}$

29. What is the volume, in cubic feet, of a cube with an edge length of 3 feet?

$\boxed{V = 27 \text{ feet}^3}$

30. What is the volume, in cubic ft, of a rectangular prism with a height of 13ft, a width of 15ft, and a length of 9ft?

$\boxed{V = 1755 \text{ ft}^3}$

31. A rectangular prism has a length of 13 meters, a height of 18 meters, and a width of 5 meters. What is its volume, in cubic meters?

$\boxed{V = 1170 \text{ meters}^3}$