



Dear Parents:

As the summer draws near, we extend to you and your child our best wishes for a relaxing and enjoyable vacation. We hope that as you plan your time together, you also look forward to working with your child to review the math skills they have learned throughout this past school year. We believe that completing the summer math packet is a great tool to help ensure your child's math skills and knowledge are maintained throughout the summer enhancing their success in Mathematics in the upcoming school year.

As mathematics is a cumulative discipline with each level building upon previously learned concepts, our students are faced with increased rigor and a higher level of complexity. Our goal steers students towards independent mathematical thought. With this thought in mind, your child's teachers have developed summer math packets that address key concepts from the previous grade. These packets provide students with extra practice on needed skills to help maintain mastery, so they are fully prepared for the next year's Math class.

All students entering grades 6-8 are expected to complete the assigned summer math packet as a way to help keep your child's math skills sharp. For optimal results, it is highly recommended that they complete a portion of the packet each week. This will ensure that skills are being reinforced weekly and that the students do not become overwhelmed.

When your child returns in August, the summer math packet will be collected by your child's teacher by the end of the first full week of school. Your student's math teacher will then spend a few days in the first week of school reviewing the concepts covered within the summer math packet.

Students will receive a hard copy of the packet from their current teacher and electronic copies are available on the school website (<https://www.dentonmagnet.com/>).

We are hopeful that with your assistance, your child will experience a smooth transition in the upcoming school year and we can achieve our goal of reinforcing, maintaining, and extending skills acquired during this past school year.

Sincerely,

*Denton Magnet Math Teachers*

# Summer Math Packet



Denton Magnet School of Technology

Grade 7 into 8

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- This packet is designed to help you retain the information you learned this year in 7<sup>th</sup> grade.
- The packet is due Wednesday, August 16, 2023.
- If you lose your packet, you can download a new copy from our website.

Have a great

Summer

**NO Calculator**

**Show work for every problem on separate sheet of paper!**

**Directions: In this first section, you will answer 50 multiple choice questions. Be sure to consider all answers and to read directions *carefully*.**

1. A football team gains 2 yards on the first play, loses 5 yards on the second play, loses 3 yards on the third play, and gains 4 yards on the fourth play. What is the team's overall gain or loss for all four plays?

- (a) A gain of 14 yards  
(b) A loss of 2 yards  
(c) A gain of 2 yards  
(d) A loss of 14 yards

2. What is the value of the expression below when  $a = -2$ ,  $b = 3$ , and  $c = -5$ ?

$$|a^2 - 2ac + 5b|$$

- (a) -9  
(b) 1  
(c) -1  
(d) 9

3. Which expression represents a *positive* integer?

- (a)  $-6^2$   
(b)  $(-5)^2$   
(c)  $(-3)^3$   
(d)  $-2^3$

4. What is the distance between the two numbers on the number line?



- (a)  $-2\frac{1}{8}$   
(b)  $1\frac{3}{8}$   
(c)  $-1\frac{3}{8}$   
(d)  $2\frac{1}{8}$

5. What is the area of a triangle with a base length of  $2\frac{1}{2}$  inches and a height of 2 inches?

- (a)  $2\frac{1}{4}in^2$   
(b)  $2\frac{1}{2}in^2$   
(c)  $4\frac{1}{2}in^2$   
(d)  $5in^2$

6. The perimeter of the rectangle is 400 inches. What is the value of  $j$ ?



- (a) 35                      (b) 140                      (c) 85                      (d) 200

7. What is the value of the expression below?

$$-\frac{3}{8} \cdot \frac{2}{5}$$

- (a)  $-\frac{20}{3}$                       (b)  $-\frac{15}{16}$                       (c)  $-\frac{16}{15}$                       (d)  $-\frac{3}{20}$

8. Which value of  $p$  makes the equation below true?

$$5(p + 6) = 25$$

- (a) -1                      (b) 11                      (c) 14                      (d)  $3\frac{4}{5}$

9. You set up a lemonade stand. You are selling each cup for \$0.50. Your profit is equal to your revenue (money earned) from lemonade sales minus your cost to operate the stand. Your cost to operate is \$8. How many cups of lemonade must you sell to earn a profit of \$30?

- (a) 4                      (b) 60                      (c) 44                      (d) 76

10. The school store sells 4 pencils for \$0.80. What is the unit cost of a pencil?

- (a) \$0.20                      (b) \$3.20                      (c) \$0.80                      (d) \$5.00

11. The quantities  $x$  and  $y$  are proportional. What is the missing value in the table?

$x$	$y$
$\frac{2}{3}$	6
$\frac{4}{3}$	12
$\frac{8}{3}$	24
5	

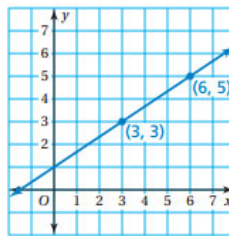
- (a) 30                      (b) 45                      (c) 36                      (d) 48

12. Which value of  $p$  makes the equation true?

$$6 - 2p = -48$$

- (a) -27                      (b) -21                      (c) 21                      (d) 27

13. What is the slope of the line?



- (a)  $\frac{2}{3}$                       (b) 2                      (c) 3                      (d)  $\frac{3}{2}$

14. Angle 1 and angle 2 form a straight angle. If angle 1 has a measure of 28 degrees, what is the measure of angle 2?

- (a) 62 degrees                      (b) 152 degrees                      (c) 118 degrees                      (d) 208 degrees

15. Your math teacher described an equation in words. She said, “five less than the product of seven and an unknown number is equal to forty-two.” Which equation matches your math teacher’s description?

- (a)  $(5-7)n = 42$                       (b)  $5 - 7n = 42$                       (c)  $(7-5)n = 42$                       (d)  $7n - 5 = 42$

16. Which value of  $x$  makes the equation below true?

$$5x - 3 = 11$$

- (a) 1.6                      (b) 40                      (c) 2.8                      (d) 70

17. Which inequality has 5 in its solution set?

- (a)  $5 - 2x \geq 3$                       (b)  $8 - 3x > -7$                       (c)  $3x - 4 \geq 8$                       (d)  $4 - 2x < -6$

18. A gift box measures 8 inches by 4 inches by 2 inches. What is the least amount of wrapping paper needed to wrap the box?

- (a)  $20 \text{ in}^2$                       (b)  $64 \text{ in}^2$                       (c)  $56 \text{ in}^2$                       (d)  $112 \text{ in}^2$

19. Which of the following could be the angle measures of a triangle?

- (a) 60, 50, 20                      (b) 30, 60, 90                      (c) 40, 80, 90                      (d) 0, 90, 90

20. The value of one of Kevin's baseball cards was \$6.00 when he first got it. The value of this card is now \$15.00. What is the percent increase in the value of the card?

- (a) 40%                      (b) 150%                      (c) 90%                      (d) 250%

21. Which of the following numbers has a value that is between 10% and  $\frac{1}{9}$ ?

- (a) 0.151                      (b) 0.112                      (c) 0.108                      (d) 0.019



26. What is the value of the expression below?

$$\frac{3}{4} \div 12$$

(a)  $\frac{1}{16}$

(b)  $\frac{1}{9}$

(c) 9

(d) 16

27. Danielle will use the instructions in the box below to make a cleaning solution.

Add 13 cups of water to every 2 cups of concentrated cleaner.

Which of the following proportions can be used to find  $w$ , the number of cups of water Danielle will add to 5 cups of concentrated cleaner?

(a)  $\frac{13}{2} = \frac{w}{5}$

(b)  $\frac{13}{2} = \frac{5}{w}$

(c)  $\frac{13}{5} = \frac{w}{2}$

(d)  $\frac{5}{2} = \frac{13}{w}$

28. The nutrition label on Erin's box of animal crackers states that 16 crackers contain 24 grams of carbohydrates. Erin ate 12 animal crackers from the box. What is the number of grams of carbohydrates in 12 animal crackers?

(a) 8 grams

(b) 12 grams

(c) 18 grams

(d) 20 grams

29. Which of the following sets of steps could be used to completely solve the equation below?

$$3x + 9 = 15$$

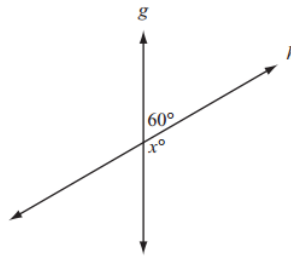
(a) add 9 to each side, and then multiply each side by 3

(b) subtract 9 from each side, and then divide each side by 3

(c) multiply each side by 3, and then add 9 to each side

(d) divide each side by 3, and then subtract 9 from each side

30. Line  $g$  intersects line  $h$  in the figure below.



Based on the angle measure given in the figure, what is the value of  $x$  ?

- (a) 30                      (b) 60                      (c) 100                      (d) 120

31. Which statement best describes a situation in which opposite quantities combine to make zero?

- (a) Jack made 8 cups of soup and divided the soup into 8 containers.  
(b) Mark deposited \$10 in his savings account and then withdrew \$10 from the account.  
(c) Peter scored 2 goals in the first period of a hockey game and 2 goals in the second period.  
(d) Andrew missed 4 questions on a test in which each question was worth 4 points.

32. What is the value of the expression below?

$$-13 - (-9)$$

- (a) 22                      (b) 4                      (c) -4                      (d) -22

33. The temperature at 6 p.m. was  $16^\circ\text{F}$ , which was  $9^\circ\text{F}$  lower than the temperature at noon. What was the temperature at noon?

- (a)  $25^\circ\text{F}$                       (b)  $7^\circ\text{F}$                       (c)  $-7^\circ\text{F}$                       (d)  $-25^\circ\text{F}$

34. Olive has 3 fair coins. She will toss each coin one time. Which of the following best describes the probability that all 3 coins will land with “heads” facing up?

- (a) Likely                      (b) Certain                      (c) Unlikely                      (d) Impossible

35. Which of the following is equivalent to the expression below?

$$(-3m + 5) + (m - 11)$$

- (a)  $4m - 16$                       (b)  $-4m - 16$                       (c)  $2m - 6$                       (d)  $-2m - 6$

36. A sign is in the shape of a triangle. It has a base of 12 inches and an area of 120 square inches. What is the height of the triangle?

- (a) 5 inches                      (b) 10 inches                      (c) 12 inches                      (d) 20 inches

37. The base of a lampshade is in the shape of a circle and has a diameter of 13 inches. What is the circumference, to the nearest tenth of an inch, of the base of the lampshade? (Use 3.14 for  $\pi$ .)

- (a) 13.3 inches                      (b) 20.4 inches                      (c) 26.0 inches                      (d) 40.8 inches

38. The ratio of the number of girls to the number of boys in a chess club is 3 to 2. There are 14 boys in the chess club. What is the number of girls in the chess club?

- (a) 7                      (b) 9                      (c) 21                      (d) 23

39. The weights, in ounces, of three different packages of cookies are listed below.

$$7.7 \quad 7\frac{1}{7} \quad 7.25$$

Which list shows these weights in order from least to greatest?

- (a) 7.25       $7\frac{1}{7}$       7.7                      (b)  $7\frac{1}{7}$       7.25      7.7  
(c) 7.25      7.7       $7\frac{1}{7}$                       (d)  $7\frac{1}{7}$       7.7      7.25

40. Lara has \$12 in quarters. The equation below can be used to solve for  $q$ , the number of quarters Lara has.

$$0.25q = 12$$

Which of the following describes a way to solve for  $q$  in one step?

- (a) Add 0.25 to both sides  
(b) Subtract 0.25 from both sides  
(c) Multiply both sides by 0.25  
(d) Divide both sides by 0.25

41. A machine packs boxes at a constant rate of  $\frac{2}{3}$  of a box every  $\frac{1}{2}$  minute. What is the number of boxes per minute that the machine packs?

- (a)  $\frac{1}{3}$                       (b)  $\frac{3}{4}$                       (c)  $1\frac{1}{6}$                       (d)  $1\frac{1}{3}$

42. In which situation could the quotient of  $-24 \div 3$  be used to answer the question?

- (a) The temperature of a substance decreased by  $24^{\circ}\text{C}$  per minute for 3 minutes. What was the overall change of the temperature of the substance?  
(b) A football team lost 24 yards on one play, then gained 3 yards on the next play. How many total yards did the team gain on the two plays?  
(c) Julia withdrew a total of \$24 from her bank account over 3 days. She withdrew the same amount each day. By how much did the amount in her bank account change each day?  
(d) A cookie jar contains 24 cookies. Each child receives 3 cookies. How many children are there?

43. A garden is 15 feet long by 5 feet wide. The length and width of the garden will each be increased by the same number of feet. This expression represents the perimeter of the larger garden:

$$(x + 15) + (x + 5) + (x + 15) + (x + 5)$$

Which expression(s) is/are equivalent to the expression for the perimeter of the larger garden?

- (i)  $4x + 40$     (ii)  $2(2x + 20)$     (iii)  $2(x+15)(x+5)$     (iv)  $4(x+15)(x+5)$     (v)  $2(x+15) + 2(x+5)$
- (a) i only              (b) ii only              (c) i and ii              (d) ii, iii, and iv              (e) i, ii, and v

44. . Rosy waxes  $\frac{2}{3}$  of her car with  $\frac{1}{4}$  bottle of car wax. At this rate, what fraction of the bottle of car wax will Rosy use to wax her entire car?

(a)  $\frac{1}{8}$

(b)  $\frac{1}{6}$

(c)  $\frac{3}{8}$

(d)  $\frac{3}{4}$

45. A train traveled  $\frac{1}{5}$  of the distance between two cities in  $\frac{3}{4}$  hour. At this rate, how many hours will it take the train to travel the entire distance between these two cities?

(a)  $\frac{3}{20}$

(b)  $\frac{4}{15}$

(c)  $3\frac{3}{4}$

(d)  $6\frac{2}{3}$

46. Reagan will use a random number generator 1,200 times. Each result will be a digit from 1 to 6. Which statement best predicts how many times the digit 5 will appear among the 1,200 results?

(a) It will appear exactly 200 times.

(b) It will appear close to 200 times.

(c) It will appear exactly 240 times.

(d) It will appear close to 240 times.

47. Simon's car travels about 28 miles per gallon of gas. Which of the following is closest to the number of gallons of gas Simon's car will need to travel 578 miles?

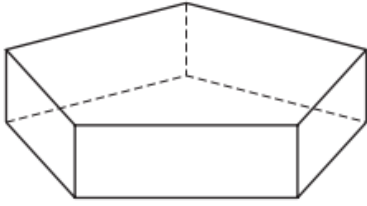
(a) 10

(b) 20

(c) 30

(d) 40

48. A pentagonal prism is shown below.



What is the total number of edges of a pentagonal prism?

- (a) 7                      (b) 10                      (c) 12                      (d) 15

49. Which of the following is equivalent to the expression below?

$$\frac{1}{5} \cdot 62$$

- (a)  $62 \div 5$                       (b)  $62 \div \frac{1}{5}$                       (c)  $5 \div 62$                       (d)  $\frac{1}{5} \div 62$

50. Tom practiced the piano 3 hours less than twice as many hours as Dale practiced. Let  $d$  represent the number of hours that Dale practiced. Which of the following expressions represents the number of hours that Tom practiced?

- (a)  $3d - 2$                       (b)  $3 - 2d$                       (c)  $2d - 3$                       (d)  $2 - 3d$

**Directions:** In this next section, you will answer 20 short answer questions. Be sure to read directions *carefully* and show your work.

51. What is the value of the expression below when  $c = 0$  and  $d = -6$ ?

$$\frac{cd - d^2}{4}$$

52. What is the value of the expression below?

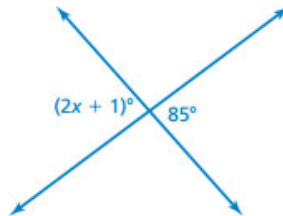
$$-0.28 \div -0.07$$

53. What value of  $y$  makes the equation below true?

$$12 - 3y = -6$$

54. What is the value of  $\frac{9}{8} \div \left(-\frac{11}{4}\right)$ ?

55. What is the value of  $x$ ?



56. An art teacher spent 7% of the art supply budget on colored paper. The art supply budget was \$1000. What was the total amount of money, in dollars, the art teacher spent on colored paper?

57. The temperature in a city increased from  $-12^\circ\text{F}$  at dawn to  $7^\circ\text{F}$  in the afternoon. What was the change in temperature in degrees Fahrenheit?

58. A hummingbird beats its wings about 75 times in one second. Based on this rate, what is the number of times a hummingbird beats its wings in one minute?

59. What value of  $n$  makes the equation below true?

$$28 + n = 0$$

60. What is the value of the expression below when  $m = 4$  and  $n = 2$  ?

$$-m(n + m)$$

61. Alice made 48 cupcakes.

- She frosted  $\frac{1}{2}$  of the cupcakes.
- She put sprinkles on  $\frac{1}{3}$  of the frosted cupcakes.
- She ate  $\frac{1}{4}$  of the frosted cupcakes that had sprinkles.

What is the total number of cupcakes that Alice ate?

62. A bunch of bananas weighs 40 ounces. What is the weight in pounds of the bunch of bananas? (1 pound = 16 ounces)

63. You return several shirts to a store. The receipt shows that the amount placed back on your credit card is \$-30.60. Each shirt is -\$6.12. How many shirts did you return?

64. On a mountain, the temperature decreases by  $18^{\circ}\text{F}$  every 5,000 feet. What integer represents the change in temperature at 20,000 feet?

65. Solve the equation below. Check your solution.

$$2(x + 1) = -2$$

66. Solve the equation below. Check your solution.

$$\frac{2}{7}k - \frac{3}{8} = -\frac{19}{8}$$

67. You withdraw \$29.79 from your bank account. Now your balance is -\$20.51. Write and solve an equation to find the amount of money in your bank account before you withdrew the money.

68. What is the unit rate if you travel 84 miles in 12 days?

69. Five movie tickets cost \$36.25. What is the cost of 8 movie tickets?

70. There are 144 people in an audience. The ratio of adults to children is 5 to 3. How many are adults?

**Directions:** In this next section, you will answer 3 open response questions. Be sure to read directions *carefully* and to answer each question completely. Show your work and circle your answer.

71.

Vic is moving, and he needs to hire a moving company. The rates for Manny's Movers and Jiffy Move are shown below.

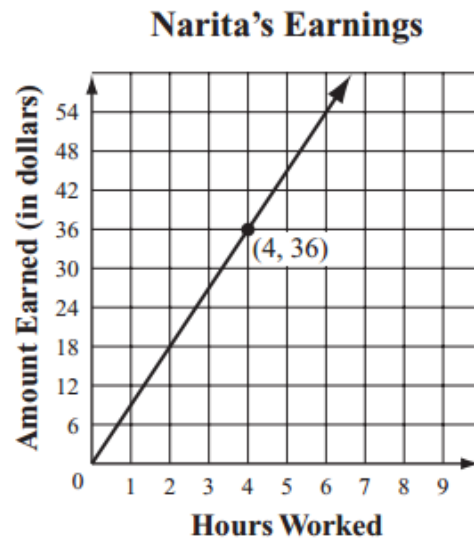
<b><u>Manny's Movers</u></b>  <b>Labor Rate</b> \$100 per hour  <b>Mileage Rate</b> \$0.75 per mile	<b><u>Jiffy Move</u></b>  <b>Labor Rate</b> \$125 per hour  <b>Mileage Rate</b> \$0.30 per mile  ***** <b>10% Discount Off the Total for Moves on Wednesdays</b>
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Vic is moving a distance of 200 miles. It will take the movers a total of 8 hours of labor.

- (a) What amount, in dollars, would Manny's Movers charge Vic for mileage? Show or explain how you got your answer.
- (b) What amount, in dollars, would Manny's Movers charge Vic for both labor and mileage? Show or explain how you got your answer.
- (c) Vic decides to move on a Wednesday. Which moving company would charge him the least amount for his move? Show or explain how you got your answer.

72.

Narita works part time on Saturdays. The graph below shows the relationship between the number of hours Narita works on Saturdays and the total amount of money she earns.



- (a) What does the point  $(4, 36)$  represent in this situation?
- (b) What does the point  $(0, 0)$  represent in this situation?
- (c) What is the amount of money, in dollars, that Narita earns for each hour she works?  
Show or explain how you got your answer.
- (d) Write an equation that could be used to find  $t$ , the total amount of money Narita earns for working  $h$  hours.

73.

Gerald wants to purchase a tennis racket and some cans of tennis balls. The table below shows the total prices he would pay at a discount store to buy one tennis racket and 1 to 4 cans of tennis balls.

**Total Prices for Tennis Racket  
and Cans of Tennis Balls**

<b>Number of Cans of Tennis Balls</b>	<b>Total Price with Racket</b>
1	\$43
2	\$46
3	\$49
4	\$52

- (a) Based on the prices in the table, what is the total price for one tennis racket and 6 cans of tennis balls? Show or explain how you got your answer.
- (b) Based on the prices in the table, what is the price for one tennis racket? Show or explain how you got your answer.
- (c) Write an expression that can be used to find the total price for one tennis racket and  $b$  cans of tennis balls. Explain your reasoning.
- (d) Gerald purchased one tennis racket and  $b$  cans of tennis balls. The total price of his purchase was \$70. How many cans of tennis balls did Gerald purchase? Show or explain how you got your answer.

**Directions:** In this last section, you will answer one problem. Be sure to read the problem *carefully* and to answer the question completely. Show your work and circle your answer. Use any method to solve this problem.

74. You have a list of 7 numbers. The average of the numbers is 9. If you take away one of the numbers, the average of the numbers is 8. What number did you take away?