Algebra 2 Honors

Name:

Summer Homework Assignment

Directions: Show all work clearly and neatly organized on a separate sheet of paper.

Solve:

1. 3(4-5k)=2k-42. 12x - 24 = -14x + 283. 18 = -6(p+5)4. 5(x-2)-3=-(x+1)5. 2x - 1 = 2(x + 4)6. 4a+1=a-5-3a7. |2y-3|+4=338. |5x-4| + 10 = 49. -6|5-2y|-4=-1310. $|\mathcal{S}+p| = 2p - 3$ 11. 4|2y-7|+5=912. -27 - 3y - 6 = -1413. $1+5(x-8) \le 2-(x+5)$ 14. 23–4*u*<3 15. 4n-5(n-3)>3(n+1)-20 16. $1-\delta u \le 3u-10$ 18. 3(5x-2) < 24 or 6x-4 > 9+5x $-8 \le 3y - 20 < 52$ 19. 2x-3>15 or 3-7x<1720. $35-5x \le 0$ and $5x+6 \ge -14$ $-1 \le 3z + 2 \le 8$ 22. $2z - 1 \le 5$ or 3z - 5 > 1023. -9 < 2r - 5 < -124. $2t+7 \ge 13$ or 5t-4 < 6 $-3 < 2 - \frac{d}{2} \leq -1$ 25. 2x+3>1 and $5x-9\leq 6$ 27. 3k+7 < 1 or 2k-3 > 1 $-6 \le 2 - 3m \le 7$ 29. 7q-1>q+11 or -11q>-33 30. 5n-1>0 or 4n+2<0

Solve:

31. |3-2t| < 532. $|2t-1|+3 \ge 8$ 33. |2d-8| > 1234. $|3d+18| \le 6$ 35. 3|y-8|+15 < 2136. |7y+14|-5 < 3037. $|2u-1|+3 \le 6$ 38. 4-|3k+1| < 239. $7-3|4d-7| \ge 4$ 40. $6+5|2r-3| \ge 4$

Graph each of the following on GRAPH PAPER.

41. $y = -\frac{2}{3}x + 5$ 42. y = 4x - 143. x - 3y = 944. 2x + 5y = -1545. 4x - 6y = 2446. -3x + 2y = -1447. 3x - y > -548. x - 2y < 849. $3x + 5y \le -10$ 50. $3x + 4y \ge 12$

Find the slope of the line passing through the points.

51. (3, -8) and (-5, 2)52. (-10, -3) or (7, 2)53. (-7, -6) and (3, -6)54. (8, 2) and (8, -5)55. (6, 1) and (8, -4)56. (-6, -5) and (4, 1)

Write the equation of the line described.

57. Slope = -5, passes through
$$(-3, -8)$$

58. Slope = $\frac{4}{5}$, passes through $(10, -3)$
59. Slope = $-\frac{1}{2}$, passes through $(2, -3)$
60. Slope = $\frac{5}{3}$, passes through $(-6, -2)$
61. Passes through $(4,3)$ and $(7, -2)$
62. Passes through $(-6, -3)$ and $(-8, 4)$
63. Passes through $(3, 11)$ and $(-6, 5)$
64. Passes through $(7, 2)$ and $(3, -5)$
65. Passes through $(6, 1)$ and $(8, -4)$
66. Passes through $(3, 2)$ and $(5, 3)$
67. x-intercept = -5, y-intercept = 7
68. x-intercept = 3, y-intercept = 2
69. Passes through $(-8, 2)$ and parallel to $5x - 4y = 1$
70. Passes through $(10, 5)$ and perpendicular to $5x + 4y = 8$

- 71. Passes through (-9,5) and perpendicular to y = -3x + 2
- 72. Passes through (2, -3) and parallel to 7x + 2y = 5

Determine the value of r so that the line through the given points has the given slope.

73.
$$(r,2), (4,-6);$$
 Slope = $-\frac{8}{3}$ 74. $(5,r), (2,3);$ Slope = 275. $(r,6), (8,4);$ Slope = $\frac{1}{2}$ 76. $(6,r), (9,2);$ Slope = $\frac{1}{3}$

Find the value of k in each equation if the ordered pair is a solution to the equation.

77. 5x + ky = 8, (3, -1)78. 4x - ky = 7, (4, 3)79. 3x + 8y = k, $(0, \frac{1}{2})$ 80. kx + 3y = 11, (7, 2)

Righetti High School Mathematics Course Syllabus: Accelerated Algebra 2 AB 2022-23

Instructor: Margaret J. Rucker Phone: 937-2051, ext. 2615 E-mail: mrucker@smjuhsd.org

Course Materials:

Textbook: Algebra and Trigonometry, Book 2: McDougal Littel Supplementary materials will be used throughout the course.

Materials Required: Pencil, Spiral Notebook (preferably graphing, or lined/graphing)

Students are required to bring a scientific calculator during <u>second</u> semester. I suggest the TI-3OX IIS, it is widely available for \$15-\$20; however, many other calculators are perfectly fine. If obtaining a calculator is a hardship, see me privately. Use on tests is at teacher discretion.

Graphing calculators will not be allowed on any test.

Course Outcomes

Algebra 2 with Trigonometry is a year long, college preparatory course with on campus honors credit. By the end of this course, each student will be able to:

- 1. Simplify and solve multistep equations and inequalities, including quadratic, rational, and radical .
- 2. Recognize, describe, graph, and analyze various functions: linear, quadratic, rational, radical, and trigonometric.
- 3. Graph linear and nonlinear equalities and inequalities, including rational and radical.
- 4. Solve systems of two and three equalities and inequalities using a variety of methods.
- 5. Perform operations on polynomials, including factoring and long division.
- 6. Identify and perform operations on complex numbers.
- 7. Graph and identify various conic sections.
- 8. Use function notation to explore polynomial functions, their graphs, and their inverses.
- 9. Use logarithmic and exponential equations and their properties to solve problems.
- 10. Use permutations and combinations to find probabilities.
- 11. Use trigonometric identities including double and half angle formulas to simplify expressions and solve equations.
- 12. Use right triangle trigonometry and the laws of sine and cosine to find missing measures.
- 13. Perform operations on matrices.
- 14. Recognize and apply formulas to arithmetic and geometric series and sequences.

At the successful completion of this course, students will move on to Calculus AB.

Attendance:

Attendance is <u>mandatory</u> to success; if you are absent, make sure you have a classmates' phone number so that you can get notes when you have missed. Algebra 2 is <u>not</u> a self-taught course--missing class, no matter how legitimate the reason, is not conducive to student success. Please see the Student/Parent handbook for the attendance/tardy policy.

Grading Policy

The student grade is determined by a weighted average based on tests, quizzes, and homework. The grading scale is as follows:

90 - 100% = A 89 - 80% = B 79 - 70% = C 69 - 60% = DBelow 60% = F

Tests: Worth 65% of the weighted average. Tests occur at the end of each unit, and are valued at 100 points. Periodically there are departmental benchmark tests, the value to be determined. Each semester, there will be a comprehensive semester final, valued at 200 points. Many or all tests will be completed without the use of a calculator.

Quizzes: Worth 20% of the weighted average. Occur with notice, and value varies.

Homework: Worth 15% of the weighted average. Assigned nightly, including Friday. Homework turned in the following day will receive 3 points, 2 points the second day, and 1 point the third day. After the third day homework will not be turned in for credit.

No homework will be accepted after the first ten minutes of class.

Cheating is not tolerated. Please refer to the Student/Parent handbook regarding rules of Academic Honesty and the major discipline policy.

A final note on grading: All work must be in pencil or it will not be accepted. In all cases, work must be shown and must support the answer given, or credit will be withheld.

Special Classroom Rules

- All students are to be seated and ready to work with all required materials when the late bell rings. Tardies will be dealt with according to school tardy policy as stated in the Student/Parent handbook.
- 2. No food, drink, or gum in the classroom.
- 3. Electronic devices including, but not limited to, cellular phones, MP3 players, etc. are not allowed. They will be confiscated and given to administration.
- 4. No personal belongings are to be out during class time.
- 5. Show respect for the classroom and others at all times.
- 6. Students are allowed three bathroom passes per semester; after that detention will be assigned for missed class time.
- 7. All school rules a listed in the Student/Parent handbook will be enforced.
- THERE WILL BE A SUMMER ASSIGNMENT REQUIRED FOR THIS COURSE. The material will be reviewed and the students will be tested on the first week of school. The work and accompanying notes will be emailed to students.

Good luck and thanks for your cooperation.

M. Rucker

Student:	Date:

Parent:______Date:_____

I. Solving Equations and Inequalities:

A. Equations

- 1. Distribute if necessary.
- 2. Combine like terms on each side separately
- 3. If there is a variable on both sides, move the smaller variable term.
- 4. Undo any adding and subtracting
- 5. Undo any multiplication and division.
- 6. If the variables drop out and leave a true statement there are infinitely many solutions; if it leaves a false statement there is no real solution.

$$2(6d+3) = 18 - 3(16 - 3d)$$

Example:
$$12d+6 = 18 - 48 + 9d$$
$$12d+6 = 9d - 30$$
$$3d+6 = -30$$
$$3d = -36$$
$$d = -12$$

- B. Absolute Value Equations
 - 1. Get the variable expression by itself.
 - 2. Set up two equations:
 - without the absolute value, equal to the positive.
 - without the absolute value, equal to the negative.
 - 3. Solve each equation.

Example:

$$\begin{vmatrix}
4p-3 \\
-2=5 \\
+2=+2 \\
|4p-3 \\
=7
\end{cases}$$
then:

$$\begin{aligned}
4p-3=7 \\
+3=+3 \\
+3=+3 \\
+3=+3 \\
+3=+3 \\
p=\frac{5}{2}
\end{cases}$$
or

$$\begin{aligned}
4p-3=-7 \\
+3=+3 \\
p=-1
\end{cases}$$

C. Inequalities:

1. Same as equalities, but when multi[plying or dividing both sides by a negative, flip the inequality sign.

Example:

$$-3(2x-5)+4 < -23$$

-6x+15+4 < -23
-6x+19 < -23
-6x < -42
x > 7

Algebra 2 with Trigonometry Honors Summer Notes

- I. Solving Equations and Inequalities:
 - D. Compound Inequalities
 - 1. "AND" solve all 3 "sides"; answers are written lower value < x < upper value

Example:

$$\begin{array}{r}
-14 \leq -m-6 \leq -8 \\
-8 \leq -m \leq -2 \\
8 \geq m \geq 2 \\
2 \leq m \leq 8
\end{array}$$

2. "OR" Solve both, answer must have "or"

Example:
$$7 - 2y < 1$$
 or $3y + 10 < 4 - y$
 $7 - 2y < 1$ $3y + 10 < 4 - y$
 $-2y < -6$ or $4y + 10 < 4$
 $y > 3$ $4y < -6$
 $y < -\frac{3}{2}$
 $y > 3$ or $y < -\frac{3}{2}$

- E. Absolute Value Inequalities
 - 1. Get the variable expression by itself.
 - 2. Set up two inequalities:
 - without the absolute value, unchanged inequality, positive.
 - without the absolute value, flipped inequality, negative.
 - 3. Solve each inequality.
 - 4. Answers are written as a compound inequality.
 - variable expression < is an "and"
 - variable expression > is an "or"

Example:
$$|2x-9| - 3 \le 24$$
Example: $|2x+4| + 7 > 19$ $|2x-9| \le 27$ $|2x+4| \ge 12$ $-27 \le 2x - 9 \le 27$ $2x + 4 \ge 12$ or $2x + 4 \le -12$ $-18 \le 2x \le 36$ $2x \ge 8$ or $2x \le -16$ $-9 \le x \le 18$ $x \ge 4$ or $x \le -8$

Algebra 2 with Trigonometry Honors Summer Notes

II. Linear Equations:

- A. Graphing Linear Equations & Inequalities
 - 1. Get into y = mx + b form
 - a. If the y-term is negative, change all signs, both sides. If it is an inequality, also flip the inequality sign.
 - b. Move the x term to the other side.
 - c. Divide each term, both sides by the y-coeffcient
 - 2. Graph
 - a. Mark b on the y-axis
 - b. Count m. Count up or down the numerator, right the denominator, mark point. Repeat if necessary.
 - c. Connect the dots. If it is an inequality without the "or equal to" dash the line.
 - d. If it is a greater than, shade above; a less than, shade below.

Example:

$$2x-3y<6$$

$$-2x+3y>-6$$

$$3y>2x-6$$

$$y>\frac{2}{3}x-2$$



B. Slope

1. Slope is a rate of change. It is the defined as :

change in vertical(y) change in horizontal(x)

- 2. To find from two points remember 3 things:
 - a. Y's on top
 - b. Same pairs vertical
 - c. Subtract. Always put the negatives in last so not to lose any double negatives.

Example: Find the slope of the line connecting (2,-3) and (-5,3).

$$\frac{-3-3}{2--5} = \frac{-6}{7}$$
 therefore the slope is $-\frac{6}{7}$

Algebra 2 with Trigonometry Honors Summer Notes

II. Linear Equations:

- C. Writing Linear Equations
 - 1. Given a point and the slope:

a. Substitute x, y, and m into y = mx + b

- b. Solve for b
- c. Rewrite the equation with x and y as variables and m and b as constants.
- 2. Given two points:
 - a. Find the slope. (See above, section II.B.)
 - b. Pick ONE point and substitute x, y, and m into y = mx + b
 - c. Solve for b
 - d. Rewrite the equation with x and y as variables and m and b as constants.

Example: Write the equation of the line passing through (2,3) and (1,5).

Slope:
$$\frac{3-5}{2-1} = \frac{-2}{1}$$
 y-intercept: $\begin{array}{c} y = mx + b \\ 3 = -2(2) + b \\ 3 = -4 + b \\ 7 = b \end{array}$ Answer: $y = -2x + 7$

3. Given a parallel or perpendicular line and a point

a. The ONLY thing you take from the given equation is the slope. If the line is parallel, keep the slope, if it is perpendicular, take the negative reciprocal (flip and change).

- b. Substitute x, y, and m into y = mx + b
- c. Solve for b
- d. Rewrite the equation with x and y as variables and m and b as constants.

Example: Write the equation of the line perpendicular to y = 2x + 5 and passing through the point (6,3).

The slope of the given line is 2, therefore the perpendicular slope is $-\frac{1}{2}$.

$$y = mx + b$$

$$3 = -\frac{1}{2}(6) + b$$

$$3 = -3 + b$$

$$6 = b$$

Answer: $y = -\frac{1}{2}x + 6$