



**FELLOWSHIP**  
**CHRISTIAN SCHOOL**  
COLOSSIANS 1: 9-12

Entering

# Algebra 2

&

# Honors Algebra 2

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# Summer Math Packet

Students,

This packet is to be completed by the first day of school and will be used as a study guide for the first assessment in the course. Please show all steps when working through the packet.

It is a mistake to do this packet at the beginning of the summer. We want these techniques to be relatively fresh in your mind in the fall. If you work a couple of problems a day, the whole packet will be completed in no time.

As math department, we hope you take this seriously, as we sincerely wish for you to be successful throughout this next year. Your preparation over the summer will be rewarded in unexpected ways during the year.

Here are some helpful websites to use, if needed:

- [www.khanacademy.org](http://www.khanacademy.org)
- [www.patrickjmt.com](http://www.patrickjmt.com)
- [www.youtube.com](http://www.youtube.com) to find specific math related topics with accompanying videos

Sincerely,

Fellowship Math Department

*Operations with Fractions – Calculator skills – you may use your calculator*

**Add or subtract. Fractions should have a simplified fraction answer.**

\_\_\_\_\_ 1.  $-\frac{19}{12} - \frac{4}{12}$  (leave answer as an improper fraction.)

\_\_\_\_\_ 2.  $-\frac{3}{10} - \left(-\frac{3}{5}\right)$

\_\_\_\_\_ 3.  $-\frac{1}{5} + \frac{3}{4} - \frac{3}{10}$

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**Multiply or divide. Simplify fractions. Fractions should have a simplified fraction answer.**  
***Calculator Skills***

\_\_\_\_\_ 4.  $-\frac{2}{3} \cdot \left(-\frac{2}{3}\right) \cdot \left(-\frac{2}{3}\right)$

\_\_\_\_\_ 5.  $(-17.22) \div (-0.14)$

\_\_\_\_\_ 6.  $\frac{4}{7} \div \left(-\frac{12}{21}\right)$

### *Evaluating Expressions*

**Evaluate each expression.**

\_\_\_\_\_ 7.  $3s - 6t$  for  $s = 10$  and  $t = 6$

\_\_\_\_\_ 8.  $|s| - |t|$  for  $s = 23$  and  $t = -17$

\_\_\_\_\_ 9.  $|s - t|$  for  $s = 23$  and  $t = -17$

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### *Polynomials*

**Simplify completely and combine like terms.**

\_\_\_\_\_ 10.  $13t - 3 - 2(7 - 4t)$

\_\_\_\_\_ 11.  $2(4x - 5y) - 3(7x + 3y)$

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**Determine whether or not the indicated number is a solution of the equation.**

\_\_\_\_\_ 12.  $2x - 6 = -16$ ;  $-2$

*Solving Equations*

**Solve.**

\_\_\_\_\_ 13.  $\frac{2}{7}x = 14$

\_\_\_\_\_ 14.  $2m + 5 - 7m = 50$

\_\_\_\_\_ 15.  $18.2 + 3.8x = 7.4 - 1.6x$

\_\_\_\_\_ 16.  $\frac{3x - 10}{8} = \frac{-x}{4}$

\_\_\_\_\_ 17.  $8 = 3 + 5(y - 2)$

\_\_\_\_\_ 18.  $4(2a - 8) = \frac{1}{6}(36a + 18)$

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**Solve.**

\_\_\_\_\_ 19. Phil's average is 0.250. This is about  $\frac{5}{6}$  as much as Joe's average. What is Joe's average? (Write answer in decimal form – do not round)

- \_\_\_\_\_ 20. One phone company charges 65% of its normal long-distance rate after 5 p.m. A day-rate long-distance call from Houston to Chicago costs 20 cents per minute. How much is an 11-minute call between these two cities after 5 p.m.?
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*Exponents*

**Simplify completely.**

\_\_\_\_\_ 21.  $4^3 \cdot 4^2$

\_\_\_\_\_ 22.  $(4a^5b^4)(-3a^4b^3)$

\_\_\_\_\_ 23.  $\frac{a^8}{a^3}$

\_\_\_\_\_ 24.  $(-2x^3y^4)^4$

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*Radical Expressions*

**Simplify completely. Assume variables are nonnegative. Leave answers in simplified radical form.**

\_\_\_\_\_ 25.  $-\sqrt{20}$

\_\_\_\_\_ 26.  $\sqrt{48x^3y^4}$

\_\_\_\_\_ 27.  $\sqrt{(x+3)^2}$

\_\_\_\_\_ 28.  $\sqrt{3ab^2cd^4} \bullet \sqrt{30a^3b^5c^2d}$

\_\_\_\_\_ 29.  $\sqrt{6}(\sqrt{10} + \sqrt{15})$

\_\_\_\_\_ 30.  $(2 - 2\sqrt{5})^2$

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**Rationalize the denominator and simplify.**

\_\_\_\_\_ 31.  $\sqrt{\frac{5}{10}}$

\_\_\_\_\_ 32.  $\sqrt{\frac{x^2}{24}}$

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**Add or subtract each expression. Leave answers in simplified radical form.**

\_\_\_\_\_ 33.  $2\sqrt{a} - 3\sqrt{a}$

\_\_\_\_\_ 34.  $\sqrt{196x} + \sqrt{625x}$

\_\_\_\_\_ 35.  $3\sqrt{15} + \sqrt{60} - 3\sqrt{45}$

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## System of Equations

- \_\_\_\_\_ 36. Use substitution to solve the system of equations. Answer should be written as an *ordered pair*.

$$-4x + y = 6$$

$$-5x - y = 21$$

- \_\_\_\_\_ 37. Use elimination to solve the system of equations. Answer should be written as an *ordered pair*.

$$7x + 2y = 24$$

$$8x + 2y = 30$$

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**Write a system of equations and then solve using substitution or elimination.**

38. A 25-cm piece of wood is cut into two pieces. One piece is 7 cm longer than the other. How long are the pieces?

Equation #1: \_\_\_\_\_

Equation #2: \_\_\_\_\_

Solution: \_\_\_\_\_

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### *Multi-Step Linear Equation Word Problems*

39. Write an equation then solve to find the integer. Two less than eight times a number is the same as nine less than seven times the number. What is the number?

Equation: \_\_\_\_\_

Solution: \_\_\_\_\_

40. Write an equation then solve to find the integers. Find three consecutive even integers with the sum of 42.

Equation: \_\_\_\_\_

Solutions: \_\_\_\_\_

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### *Literal Equations (Solving for a specific variable)*

**Solve for the specific variable.**

\_\_\_\_\_ 41.  $A = \frac{1}{3}bh$  for  $b$

\_\_\_\_\_ 42.  $Q = 4\pi r + 2h$  for  $r$

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### *Linear Inequalities*

**Determine whether the specified number is a solution of the inequality. Answer yes or no.**

\_\_\_\_\_ 43.  $4y - 8y > 6$ ; -2

Solve the following inequalities. Answer in interval notation.

\_\_\_\_\_ 44.  $x - 9 \geq -3$

\_\_\_\_\_ 45.  $-.7x \geq 2.1$

\_\_\_\_\_ 46.  $2p + 5 < 17$

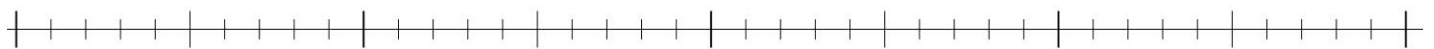
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Solve. Graph the solution set on the number line below.

47.  $t + 5 > 9$



48.  $-2a - 6 \geq -5$



## Linear Equations

Find the equation of the line containing the following pairs of points or the given point with the indicated slope. (Write in SLOPE-INTERCEPT form.)

\_\_\_\_\_ 49.  $(-5, 2); m = 3$

\_\_\_\_\_ 50.  $(9, 3)$  and  $(19, -17)$

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Find the slope (m) AND y-intercept (b) of each line.

m: \_\_\_\_\_ b: \_\_\_\_\_ 51.  $y = -3x + 6$

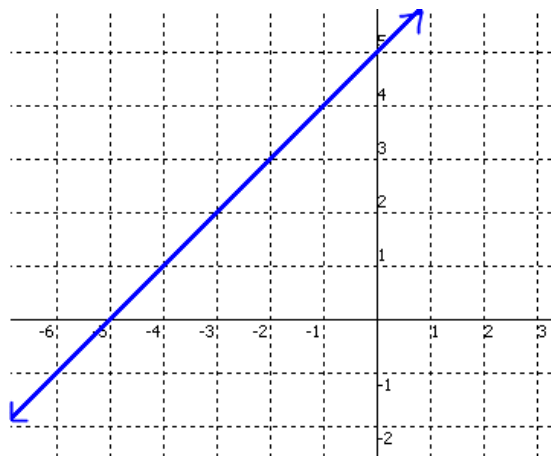
m: \_\_\_\_\_ b: \_\_\_\_\_ 52.  $3y = -15x + 18$

m: \_\_\_\_\_ b: \_\_\_\_\_ 53.  $8x + 2y - 12 = 0$

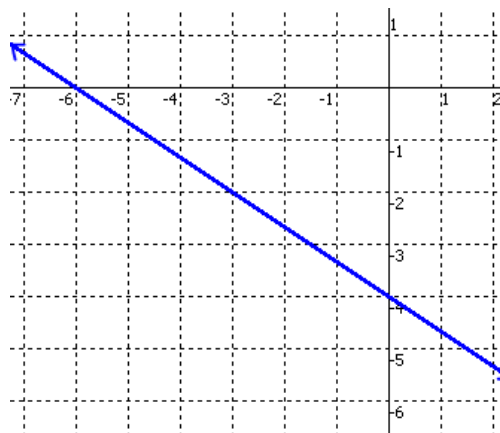
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Write the equation in slope-intercept form of the line shown.

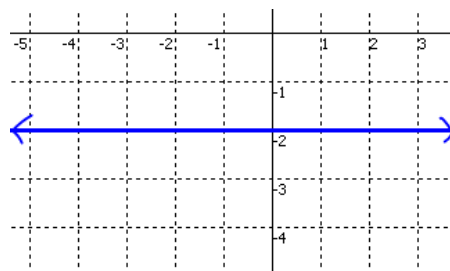
54. Equation: \_\_\_\_\_



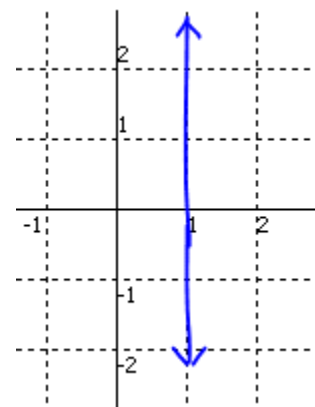
55. Equation: \_\_\_\_\_



56. Equation: \_\_\_\_\_



57. Equation: \_\_\_\_\_



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## Factoring Polynomials

### Methods of Factoring:

- Greatest Common Factor (GCF)
- Difference of Two Squares (DOTS)
- Trinomial with  $a=1$
- Perfect Square Trinomial
- Grouping

Factor completely by using GCF method.

\_\_\_\_\_ 58.  $2prh + 4pr$

\_\_\_\_\_ 59.  $6x - 24y - 12$

Factor completely.

\_\_\_\_\_ 60.  $y^2 - 6y + 9$

\_\_\_\_\_ 61.  $x^2 - 9$

\_\_\_\_\_ 62.  $2x^2 - 2y^2$

\_\_\_\_\_ 63.  $3y^3 + 9y^2 - 2y - 6$

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## Quadratic Equations

**Solve** each quadratic equation.

To solve either:

- Factor
- use square root
- quadratic formula

then solve. (HINT: There should be TWO answers.)

\_\_\_\_\_ 64.  $s^2 + 5s = 0$

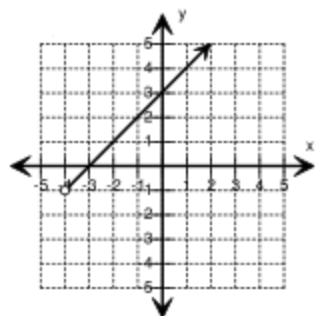
\_\_\_\_\_ 65.  $w^2 - 144 = 0$

\_\_\_\_\_ 66.  $x^2 - 2x - 15 = 0$

\_\_\_\_\_ 67.  $6x^2 + 11x + 4 = 0$

What is the domain and range for the following graphs in interval notation?

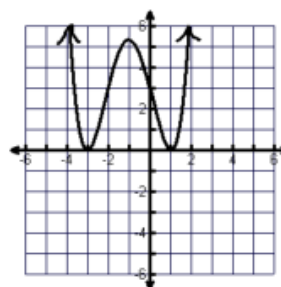
68.



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

69.

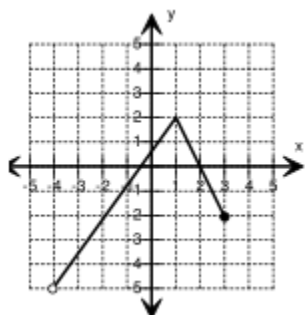


Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Tell when the graph is increasing and decreasing in interval notation.

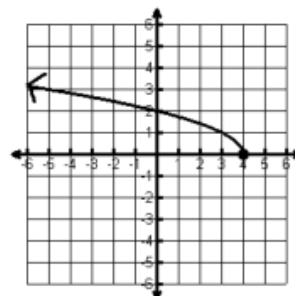
70.



Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

71.



Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

Describe the end behavior:

72.  $x \rightarrow \underline{\hspace{1cm}} \quad f(x) \rightarrow \underline{\hspace{1cm}}$   
 $x \rightarrow \underline{\hspace{1cm}} \quad f(x) \rightarrow \underline{\hspace{1cm}}$

