Geometry Honors Summer Homework

Name _____

Dear Future Geometry Student,

I hope you are excited for your upcoming year in Geometry! Geometry allows us to measure the world around us in a very precise and accurate manner. It allows us to form valid arguments with deductive reasoning, and find counterexamples. This branch of mathematics is foundational for all other areas of math. Your level of success in Geometry will directly correlate to how successful you will be in your future math experiences. As you probably know, your high school mathematics classes are cumulative. This means that you will need to utilize concepts previously learned to be successful. The purpose behind this summer homework packet is to reacquaint you with the necessary skills to be successful in this year's math course.

Please be prepared to submit this assignment during your **second Geometry class**. It will be graded for accuracy as well as completion. Work needs to be shown in a neat and organized manner, and it is perfectly acceptable to complete the packet on separate sheets of paper. Just be sure to staple any extra papers to the packet. Also, do not rely on a calculator. Show ALL work for each problem and take your time. Remember, this will be your first impression to your new math teacher, and you want to make sure that it is a positive one! See below for directions and helpful websites. We hope you have a wonderful summer!

Best,

Wareham High School Math Department

Students who are enrolled in BOTH Geometry Honors and Algebra 2 Honors are expected to complete the Geometry packet as well as the Algebra 2 Honors Packet.

Need help with your Summer math packet???

Feel free to email Mrs. Medina at mmedina@wareham.k12.ma.us with any questions you might have. To ensure the fastest response, please include your name, summer assignment name, and (if possible) a picture of the problem and your accompanying work.
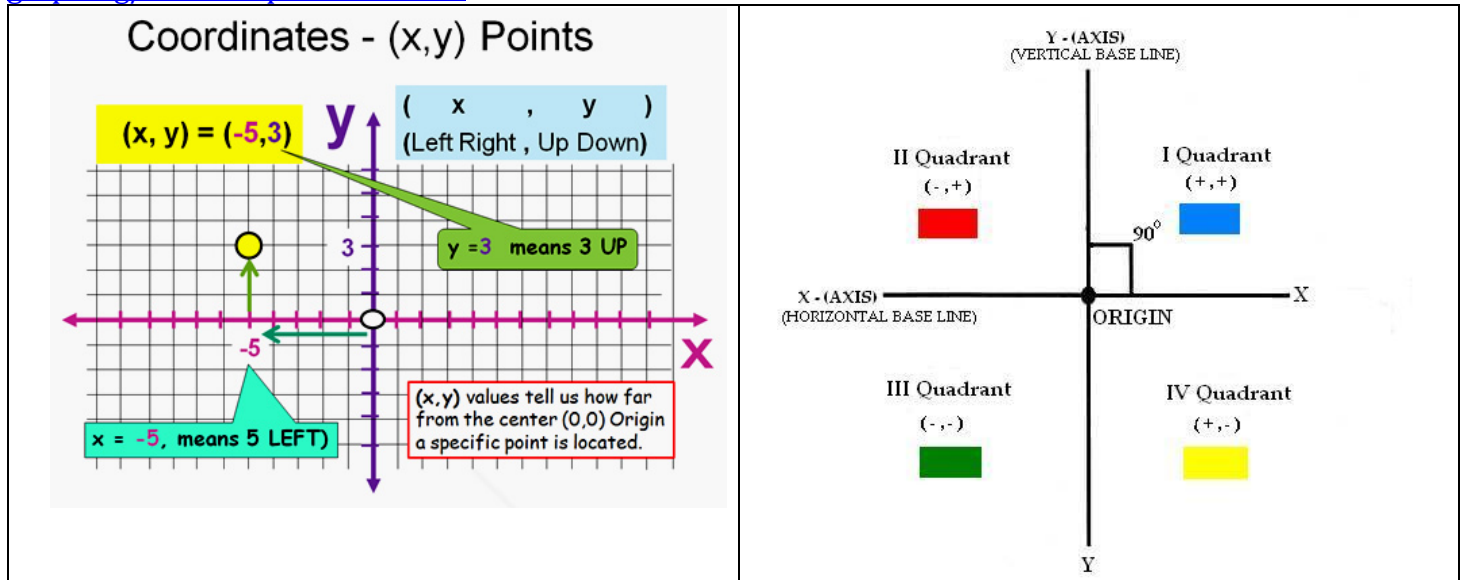

Directions:

- Before answering any questions, read through the given notes and examples for each topic.
- This packet is to be submitted during your **second geometry** class period.
- All work must be shown in the packet or on a separate sheet of paper stapled to the packet.
- **To avoid a penalty on your grade, final answers MUST BE BOXED or CIRCLED.**

Suggestions for time management: Since there are 7 parts of this packet, complete 1 part per day (approx. 25 min each day). You can complete this packet in 7 days!

Part 1 – Plotting Points

Coordinates - (x,y) Points

(x, y) = (-5,3)

(x , y)
(Left Right , Up Down)

y =3 means 3 UP

x = -5, means 5 LEFT)

(x,y) values tell us how far from the center (0,0) Origin a specific point is located.

Y - (AXIS) (VERTICAL BASE LINE)

II Quadrant (-,+)

I Quadrant (+,+)

90°

X - (AXIS) (HORIZONTAL BASE LINE)

ORIGIN

III Quadrant (-,-)

IV Quadrant (+,-)

Y

Graph and label each point on the coordinate plane. Name the quadrant where each point is located.

1. $T(2,5)$ Quadrant _____
2. $D(3,4)$ Quadrant _____
3. $R(-3,-2)$ Quadrant _____
4. $B(5,-1)$ Quadrant _____
5. $S(2,0)$ Quadrant _____
6. $M(-1,3)$ Quadrant _____
7. $P(1,-4)$ Quadrant _____
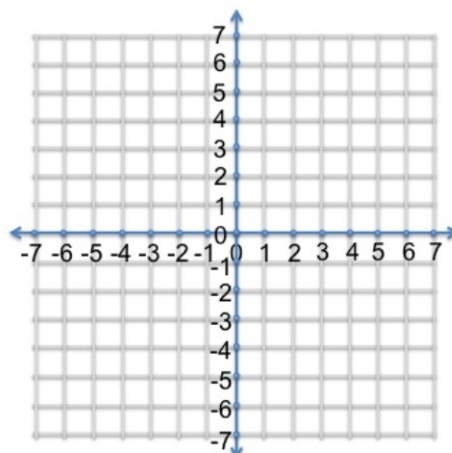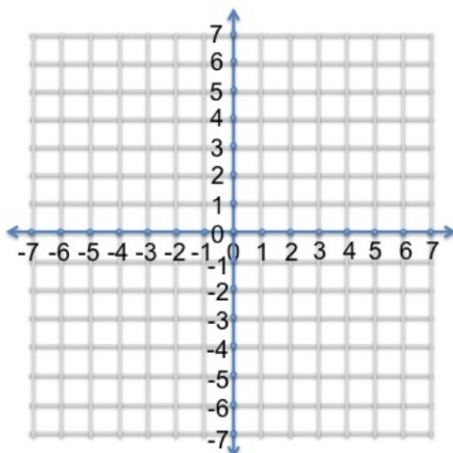8. $L(-4,-3)$ Quadrant _____
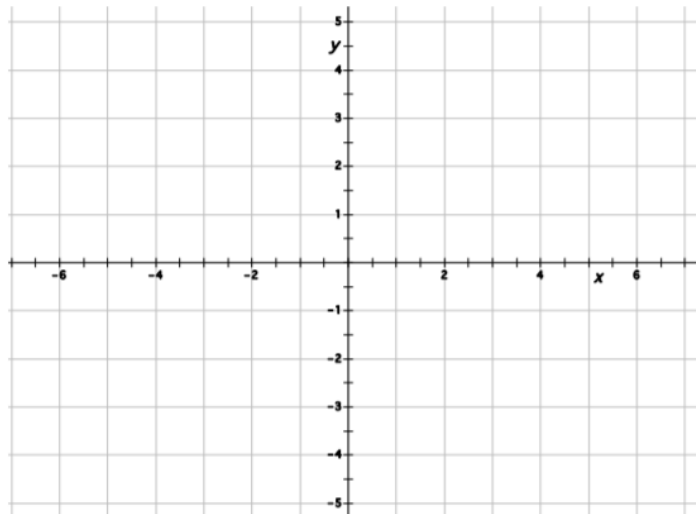
9. A triangle with vertices

$F(2,4), G(-3,2), H(-1,-1)$

10. A polygon with vertices

$J(4,2), K(1,-1), L(-2,2), M(1,5)$

Part 2 – Solving Equations

https://www.khanacademy.org/math/algebra/one-variable-linear-equations#alg1-one-step-add-sub-equations

Example 1:	Example 2:
$x - 7 = 12$ $\underline{+7 \quad +7}$ $x = 19$	$-7m = 56$ $\dfrac{-7m}{-7} = \dfrac{56}{-7}$ $m = -8$

Solve.

11. $r + 11 = 3$	12. $d - 7 = 8$	13. $5t + 1 = -19$
14. $-4 - p = -2$	15. $9 - 4g = -15$	16. $8a + 11 = -37$

Example 1:	Example 2:
$\dfrac{x}{3} = 12$ $\dfrac{x}{3} \times \dfrac{3}{1} = 12 \times 3$ $x = 36$	$-3x - 6 = 12$ $-3x - 6 + 6 = 12 + 6$ $-3x = 18$ $\dfrac{-3x}{-3} = \dfrac{18}{-3}$ $\boxed{x = -6}$

https://www.khanacademy.org/math/algebra/one-variable-linear-equations#alg1-two-steps-equations-intro

17) $\dfrac{p}{12} = 6$	18) $\dfrac{12}{5}f = -18$	19) $\dfrac{8}{5}a = -6$
20) $\dfrac{y}{7} = -11$	21) $\dfrac{m}{10} + 15 = 21$	22) $\dfrac{7}{4}q - 2 = -5$

Example 1:		

Correct *steps for solving:*
$$3x + 5 - 2x = 6x - 10$$

$$3x + 5 - 2x = 6x - 10$$
$$\Rightarrow x + 5 = 6x - 10$$
$$\quad\quad -5 \quad\quad -5$$

Combine same side like terms first!

$$x = 6x - 15$$
$$-6x \quad -6x$$

$$\frac{-5x}{-5} = \frac{-15}{-5}$$

$$x = 3 \quad \checkmark \textbf{Correct!}$$

23) $c - 14 = -11$	24) $3n + 7 = 28$	25) $2p + 6 = 6p - 10$
26) $5c - 7 = 8c - 4$	27) $8t + 1 = 3t - 19$	28) $9n + 4 = 5n + 18$

Example 1:	**Example 2:**

Example 1:

$$7x + 3(-4x - 5) = -65$$
$$7x - 12x - 15 = -65$$
$$-5x - 15 = -65$$
$$-5x = -50$$
$$x = 10$$

Example 2:

Solve: $\frac{1}{2}x^2 + \frac{7}{6}x + \frac{1}{3} = 0$

$$\frac{1}{2}x^2 + \frac{7}{6}x + \frac{1}{3} = 0$$
$$\Rightarrow 6\left(\frac{1}{2}x^2 + \frac{7}{6}x + \frac{1}{3}\right) = 6(0)$$
$$3x^2 + 7x + 2 = 0 \Leftarrow$$
$$(3x + 1)(x + 2) = 0$$
$$3x + 1 = 0 \quad or \quad x + 2 = 0$$
$$3x = -1$$
$$x = -\frac{1}{3} \quad\quad x = -2$$
$$\text{Solution Set } \left\{-\frac{1}{3}, -2\right\}$$

To clear the fractions multiply both sides by 6.

No more fractions solve like normal.

29) $6(3x - 5) - 7x = 25$	30) $15(t + 2) + 9t = 6$

31) $-2(5+6m)+16=-90$	32) $5(m-1)=-25$

Part 3 – Graphing and Solving Systems of Equations

https://www.khanacademy.org/math/algebra-basics/core-algebra-systems/corealgebra-systems-tutorial/e/graphing_systems_of_equations
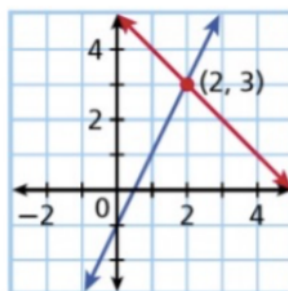
How do you solve a system of equations by graphing?

Step 1:
Set-up each equation to be graphed in slope-intercept form (solve for y).

Step 2:
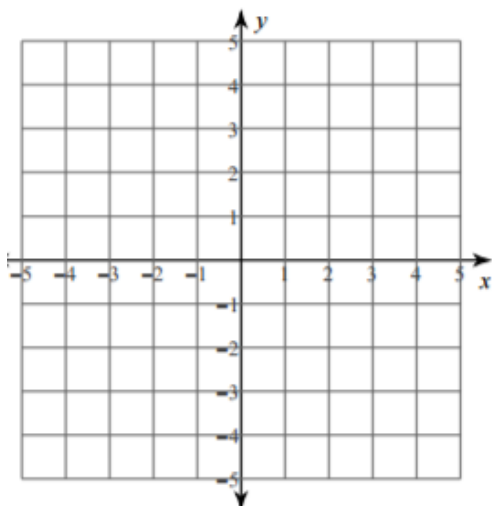Graph each equation and look for the intersection point; write the ordered pair as your answer.

(2, 3)

Step 3:
Check your answer by substituting the point in both equations.

33)

$$y=-\frac{1}{2}x-1$$
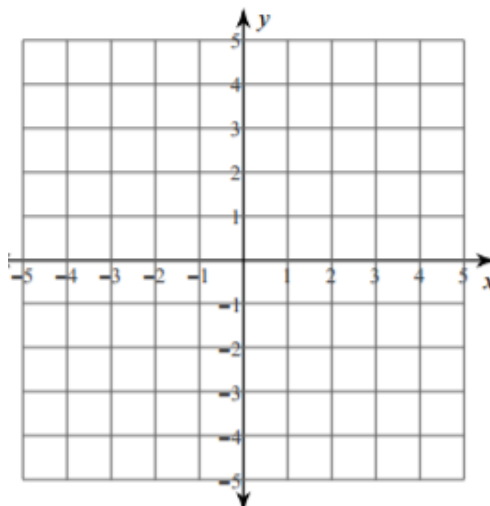
$$y=\frac{1}{4}x-4$$

34)

$$y=-\frac{5}{3}x+3$$

$$y=\frac{1}{3}x-3$$

Part 4 – Graph by Finding Intercepts – Complete the process below for each equation in the problem. You should have

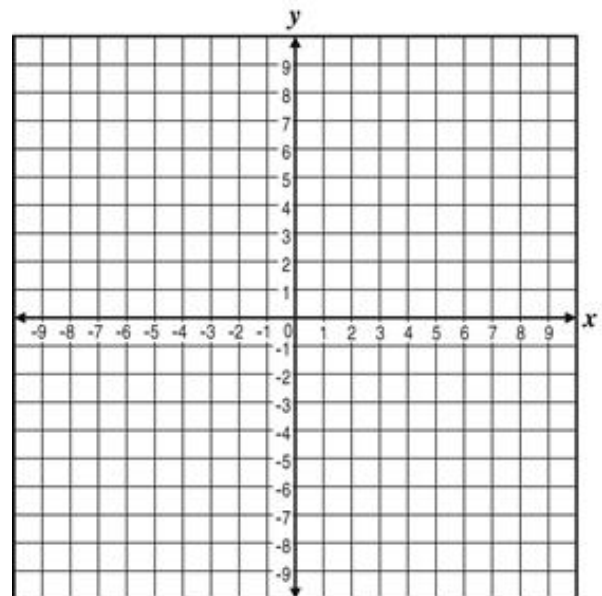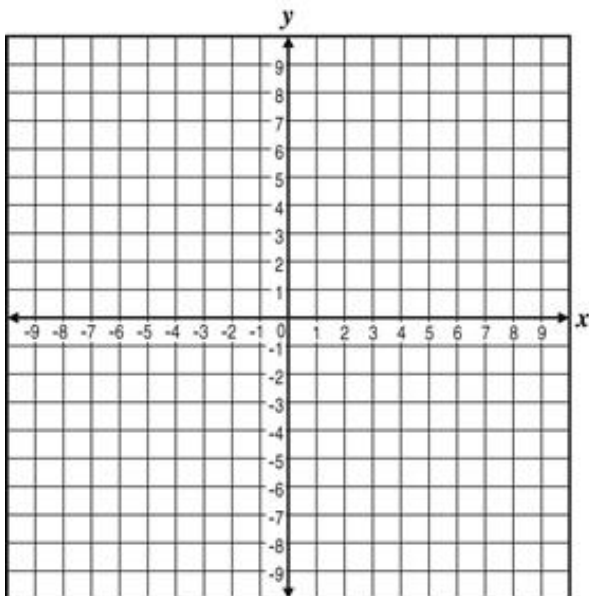| To find the *x*-intercept, set $y = 0$.	To find the *y*-intercept, set $x = 0$.
$2x - 3y = 12$	$2x - 3y = 12$
$2x - 3(0) = 12$	$2(0) - 3y = 12$
$2x = 12$	$-3y = 12$
$x = 6$	$y = -4$
x-intercept : $(6, 0)$	*y*-intercept : $(0, -4)$

35) $4x - y = 8$

$2x - 3y = 3$

36) $x + 3y = 6$

$4x - 2y = -32$

Part 5 – Square Roots and Simplifying Radicals

Complete the Table of Perfect Squares

2^2	3^2	4^2	5^2	6^2	7^2	8^2	9^2	10^2	11^2	12^2	13^2

• Look for perfect square factors

Perfect squares – 4, 9, 16, 25, 36, ...

$\sqrt{4}$ $\sqrt{9}$ $\sqrt{16}$ $\sqrt{25}$ $\sqrt{36}$

2 3 4 5 6 ....

Example

$\sqrt{75} = \sqrt{25 \cdot 3} = \sqrt{25} \cdot \sqrt{3} = 5\sqrt{3}$

↑ Factor   ↑ seperate radicals

https://www.khanacademy.org/math/algebra-basics/core-algebra-foundations/squareroots-for-college/v/simplifying-radicals

Simplify the following radicals.

37) $\sqrt{12}$	38) $\sqrt{32}$	39) $\sqrt{75}$	40) $\sqrt{108}$
41) $\sqrt{125}$	42) $\sqrt{60}$	43) $\sqrt{72}$	44) $\sqrt{216}$

Example 1:

$$4\sqrt{27} = 4\sqrt{9} \cdot \sqrt{3}$$
$$4\sqrt{9} \cdot \sqrt{3} = 4 \cdot 3 \cdot \sqrt{3}$$
$$12\sqrt{3}$$

45) $3\sqrt{8}$	46) $2\sqrt{60}$	47) $4\sqrt{32}$	48) $2\sqrt{150}$
49) $5\sqrt{80}$	50) $8\sqrt{18}$	51) $7\sqrt{32}$	52) $3\sqrt{48}$

Example 2:

$$\sqrt{2} \cdot \sqrt{6} = \sqrt{2 \cdot 6} \quad \text{\textit{Multiply the radicands.}}$$
$$= \sqrt{12} \quad \text{\textit{Simplify.}}$$
$$= \sqrt{2^2 \cdot 3}$$
$$= 2\sqrt{3}$$

53) $\sqrt{6} \cdot \sqrt{6}$	54) $\sqrt{16} \cdot \sqrt{25}$	55) $\sqrt{8} \cdot \sqrt{12}$	56) $\sqrt{5} \cdot \sqrt{15}$

Part 6 – Writing Linear Equations from a Point and a Slope

Example 1:

Find the equation of the line passing
through the point (3,-1) with a slope of 2.

$$y - y_1 = m(x - x_1)$$

Point-Slope Form for
the equation of a line

$$y - (-1) = 2(x - 3)$$

Substitute the coordinates of
the point and the slope in the
appropriate places

$$y + 1 = 2x - 6$$

$$y = 2x - 6 - 1$$

Solve for y

$$y = 2x - 7$$

57) Find the equation of the line passing through the point (2, 4) with a slope of 5.

58) Find the equation of the line passing through the point (4, -1) with a slope of -3.

59) Find the equation of the line passing through the point (-4, -5) with a slope of $-\frac{5}{6}$.

Part 7 – Writing Linear Equations from Two Points

Example 1:

- Find slope: $m = \frac{y_2 - y_1}{x_2 - x_1}$

- Plug into point-slope form:

$$y - y_1 = m(x - x_1)$$

- Rewrite the equation in slope-intercept form:

$$y = mx + b$$

- **Example:** Find the slope-intercept form of the equation of the line passing through (2, 3) and (-4, 9).

$$m = \frac{9-3}{-4-2} = \frac{6}{-6} = -1$$

$$y - 3 = -1(x - 2)$$
$$y - 3 = -x + 2$$
$$y = -x + 5$$

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60) Determine the equation of the line passing through the points (0, 0) and (2, -6).

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61) Determine the equation of the line passing through the points (2, 3) and (5, 9).

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62) Determine the equation of the line passing through the points (-6, 10) and (-2, -1).