Name: _____

The goal of this summer assignment is to allow you to practice skills that are essential for success in your Geometry class. You should be fluent in these topics when you come to class in August. This packet will be collected and checked for a homework grade. You will be assessed on questions similar to these during the first two weeks of school. If you need help please use online resources to review some topics. We recommend http://www.khanacademy.org/math/algebra

Equations of a Line

Standard Form:
$Ax + By = C$
where A and B are not both zero

Slope-Intercept Form:
$y = mx + b$ or $y = b + mx$
where m = slope and b = y-intercept

Point-Slope Form:
$y - y_1 = m(x - x_1)$
where m = slope, (x_1, y_1) = point on line

Slope Formula

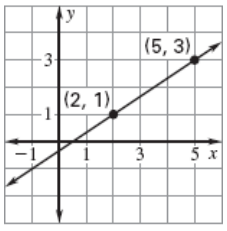
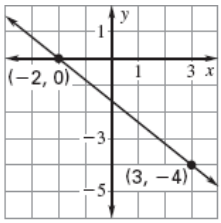
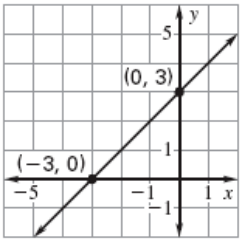
Let (x_1, y_1) and (x_2, y_2) be two points in the plane.

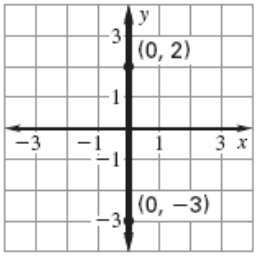
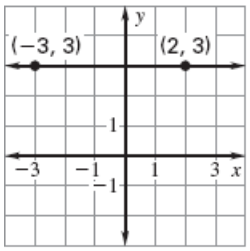
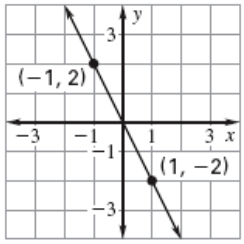
slope $= \frac{y_2 - y_1}{x_2 - x_1}$ where $x_2 \neq x_1$

1. Find the slope of the line that passes through each pair of points.

a) (5, 1) and (2, 7)	b) (-3,4) and (-3,10)	c) (2, - 3) and (5, -4)
d) (4,8) and (4, 7)	e) $(-\frac{1}{2}, -2)$ and $(-\frac{3}{2}, 1)$	

2. Find the slope of each line.

(a) 	(b) 	(c) 

(d) 	(e) 	(f) 

3. Identify the slope and y-intercept of each linear equation below.

a) $y = 3x + 1$	b) $y - 2 = -3x$	c) $5x - 3y = 12$	d) $x = 8$	e) $2y + 4 = -6x$

4. Write an equation in <u>slope-intercept form</u> of the line with the given slope and y-intercept.

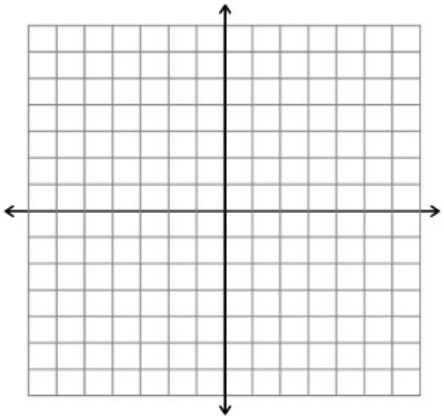
(a) $m = 1$, b = -1	(b) $m = 0$, b = 3	(c) $m = \frac{2}{3}$, b = 0

5. Determine the equation in <u>slope-intercept form</u> for each line using the given information.

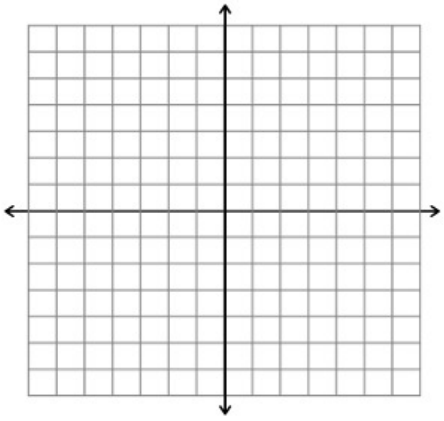
(a) slope 5, contains the point (3, 2)	(b) contains the points (-1, 2) and (5, 6)

6. Graph the linear functions in the grid provided.

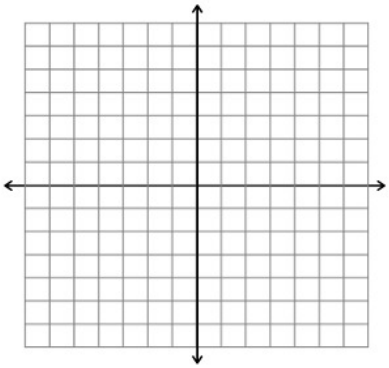
a) $y = 2x - 1$



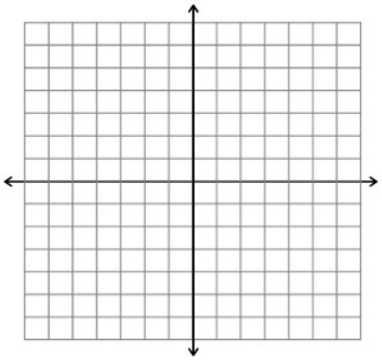
b) $y = \frac{2}{3}x$



c) $y = \frac{-1}{2}x + 3$

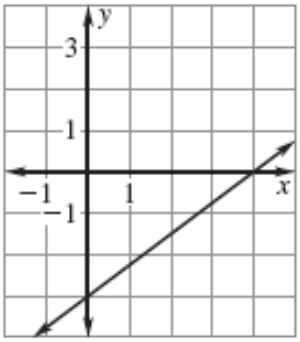


d) Line with a slope of 3, passing through the point $(-4,-2)$

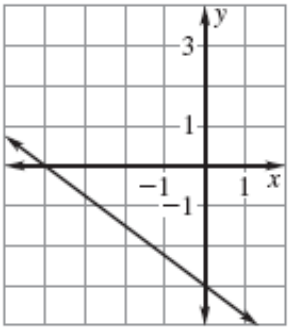


7. Write the equation in slope-intercept form of each line graphed below.

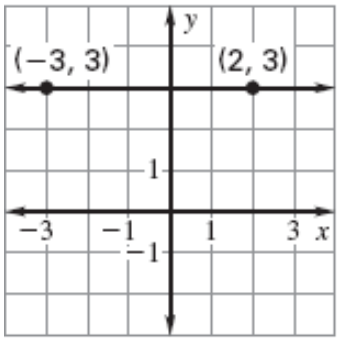
(a)



(b)



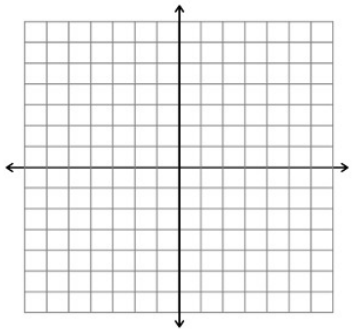
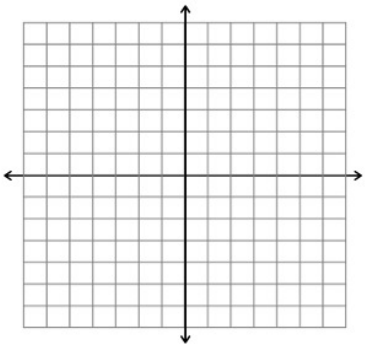
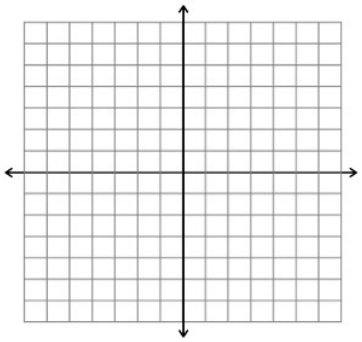
(c)



8. Write an equation in point-slope form of the line using the given information.

(a) (3, -4); m = 2	(b) (4, 2); m = $-\frac{1}{2}$	(c) (1, 0); m = 7

9. Graph each equation using x- and y-intercepts.

(a) $x + y = 4$ 	(b) $-2x + y = 8$ 	$6x - 2y = 18$ 

10. Write the following equations of a line in slope-intercept form. (i.e. solve for y)

(a) $-x + 2y = -8$	(b) $2x - 8y = -16$	(c) $y + 3 = -4(x - 1)$

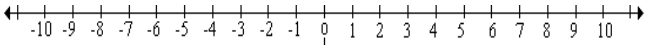
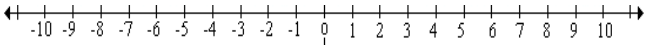
11. Determine whether the graphs of the given equations are parallel (same slope), perpendicular (slopes are opposite reciprocals), or neither.

(a) y = 2x + 6 y = -2x + 1	(b) y = 4x – 2 -x + 4y = 0

12. Solve the following absolute value equations. Remember, you should have two answers.

(a) $\lvert x+2\rvert = 9$	(b) $\lvert x-3\rvert = 1$

13. Solve the following absolute value inequalities.

(a) $\lvert x-3\rvert > 1$ 	(b) $\lvert 2x+3\rvert \leq 5$ 

14. Solve the following systems of equations using the method of your choice. (You can use elimination or substitution method). Your final answer will be a coordinate: (x, y)

a) $y = 2x+1$ $4x - y = 5$	b) $4x+2y=10$ $3x-2y=-3$	c)

15. Simplify the following expressions.

a) $12p^2 + 8p^2 - 4p + p^2$	b) $2m^3n^3 + 9m^3n^3$	c) $3(x+2) + 4(x-5)$	d) $5bc^4 - 13bc^4$

16. Multiply (i.e. distribute and/or FOIL). Simplify your final answer by collecting like terms.

a) $(3p^2)(4q^5)$	b) $4x(x-9)$	c) $(m-1)(m-1)$	d) $(2x+1)(3x-5)$	e) $(s-5)^2$

17. Factor the following expressions

a) $2x + 4x^2$	b) $6x^3 + 2x^2$	c) $q^2 - 9q + 18$
d) $j^2 - 12j + 36$	e) $k^2 - 4k - 32$	f) $x^2 - 25$

18. Solve each quadratic equation (You may need to factor and set each factor = 0)

a) $3x^2 - 12 = 0$	b) $x^2 + 11x + 10 = 0$	c) $x^2 - 6x - 7 = 0$	d) $x^2 - 14x + 45 = 0$

19. Evaluate each expression for the given values: $n = 2$, $x = 6$, and $y = 4$

a) $4n + x(y+1)$	b) $x^2 - ny$	c) $5\,|\,y - x\,| - |\,n\,|$	d) $\sqrt{8n}$

20. Evaluate the following expressions. Remember to use order of operations (PEMDAS)

a) $\dfrac{-2\cdot 12 + 4(5)}{2\cdot 3}$	b) $-5 + 3(10-4)$	c) $6(7-9)^2 + (-5)^2$
d) $\dfrac{2}{3} \div \dfrac{5}{7} - 2$	e) $-10 \div 2(12-4) + 5(-2)$	f) $-2\,|\,10-4\,|$

21. Use the following numbers to answer the questions below:

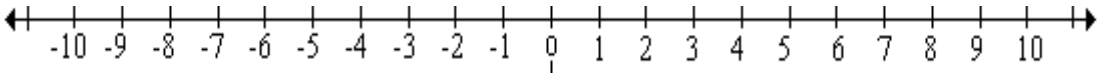
4 5 10 2 5 5 3 8 6 2

a) Median	b) Mode	c) Mean	d) Range
e) Probability of selecting an even number?	f) Probability of selecting a factor of 10?		

22. Solve the following linear equations

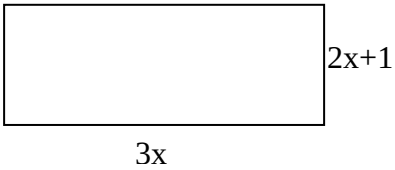
a) $3(2x-1)-6=18$	b) $\frac{1}{2}(8x-10)+\frac{1}{3}(6x-12)=15$	c) $3x+5+2x-1=25-2x$
d) $\frac{3x}{5}=\frac{18}{20}$	e) $\frac{2x+4}{3}=\frac{x-6}{5}$	f) $\frac{5x}{4}-3=2$

23. Solve and graph the solution to the inequality: $-3x+5>x-19$



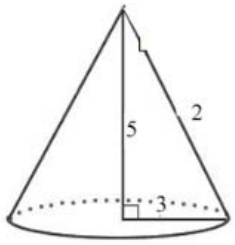
24. Solve the equation $4b-2a=3$, for b

25. The perimeter of the rectangle below is 32cm. Find the length and width of the rectangle.



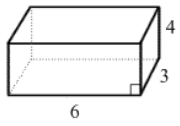
26. Find the volume of the following solids. The volume formulas are given

a)



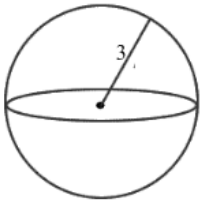
Volume $V = \frac{1}{3}\pi r^2 h$

b)



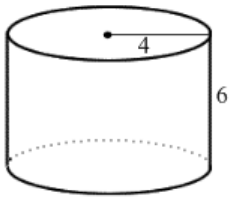
Volume $V = lwh$

c)



Volume $V = \frac{4}{3}\pi r^3$

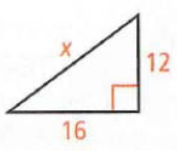
d)



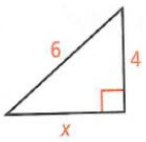
Volume $V = \pi r^2 h$

27. The Pythagorean Theorem is used to find the missing side of a right triangle when two sides are given. Use the formula $a^2 + b^2 = c^2$ to find the missing side of the triangles below. Simplify your radicals completely.

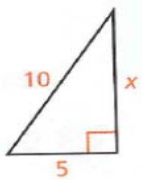
a)



b)



c)



d)