

Name

Key

Alg1H Midyear Review 2018/19

MID YEAR FINAL WILL BE ON 1/9/19

Solve the following. For inequalities provide the graph. Show all work and circle your final answer.

1.) $\frac{1}{3}(6x + 3) = 3(x - 3)$

$$\frac{6}{3}x + \frac{3}{3} = 3x - 9$$

$$\cancel{2x} + 1 = 3x - 9$$

$$-2x \quad -2x$$

$$1 = x - 9$$

$$+9 \quad +9$$

$$10 = x$$

3.) $4(x - 2) \geq -3(2x - 4)$

$$4x - 8 \geq -6x + 12$$

$$+6x \quad +6x$$

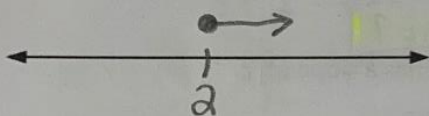
$$10x - 8 \geq 12$$

$$+8 \quad +8$$

$$10x \geq 20$$

$$\frac{10x}{10} \geq \frac{20}{10}$$

$$x \geq 2$$



2.) $\frac{2a}{5} - 3 = -10$

$$+3 \quad +3$$

$$5 \cdot \left(\frac{2a}{5}\right) = (-7) \cdot 5$$

$$\cancel{2a} = \frac{-35}{2}$$

$$a = \frac{-35}{2} \text{ OR } -17\frac{1}{2}$$

4.) $1 - 3r \geq 10$

or

$6r + 2 \geq -10$

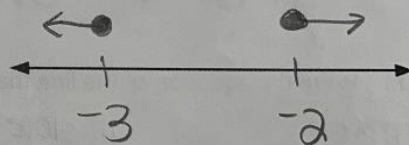
$$\cancel{-1} \quad -1$$

$$\cancel{-2} \quad -2$$

$$\frac{-3r \geq 9}{-3 \quad -3}$$

$$\frac{6r \geq -12}{6 \quad 6}$$

$$r \leq -3 \text{ OR } r \geq -2$$



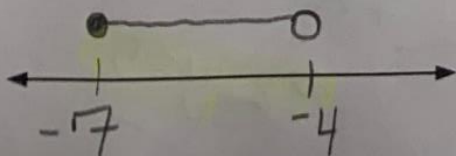
5.) $-6 \leq 2x + 8 < 0$

$$\cancel{-8} \quad \cancel{-8} \quad \cancel{-8}$$

$$\frac{-14 \leq 2x < -8}{2 \quad 2 \quad 2}$$

$$-7 \leq x < -4$$

for #5 4-5
Make sure
the numbers
on the number
line are in
numerical
order!



1

Simplify each.

6.) $(-5)^2 - 2x + x^2$ when $x = 3$

$$\begin{aligned} &(-5)^2 - 2(3) + (3)^2 \\ &25 - 6 + 9 \\ &19 + 9 = \boxed{28} \end{aligned}$$

8.) $(6 - 5)^3 + 14 \div (2 + 5) =$

$$\begin{aligned} &(1)^3 + 14 \div (7) \\ &1 + 14 \div 7 \\ &1 + 2 \\ &\boxed{3} \end{aligned}$$

7.) $-3x - 5 \cdot 2$ if $x = -6$

$$\begin{aligned} &-3(-6) - 5 \cdot 2 \\ &18 - 5 \cdot 2 \\ &18 - 10 \\ &\boxed{8} \end{aligned}$$

9.) $2 + (3^2 - 4) \cdot 6 \div 3 =$

$$\begin{aligned} &2 + (9 - 4) \cdot 6 \div 3 \\ &2 + (5) \cdot 6 \div 3 \\ &2 + 30 \div 3 \\ &2 + 10 \\ &\boxed{12} \end{aligned}$$

10.) Solve the proportion.

$$\frac{x-2}{3} = \frac{x+7}{4}$$

$$\begin{aligned} &4(x-2) = 3(x+7) \\ &4x-8 = 3x+21 \end{aligned}$$

$$\begin{aligned} &4x-8 = 3x+21 \\ &\quad -3x \quad -3x \\ &\quad \hline &x-8 = 21 \\ &\quad +8 \quad +8 \\ &\quad \hline &x = 29 \end{aligned}$$

11.) Write the equation of the line that passes through the point $(1, -2)$ and has a slope of 2.

$$\begin{aligned} &y = mx + b \\ &m = 2 \\ &b = -4 \end{aligned}$$

In slope int form

$$\begin{aligned} &y = mx + b \\ &-2 = 2(1) + b \\ &-2 = 2 + b \\ &\quad -2 \quad -2 \end{aligned} \rightarrow b = -4$$

$$\boxed{y = 2x - 4}$$

12.) Write the equation of the line in standard form that passes through the points $(3, -4)$ and $(0, 5)$.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - (-4)}{0 - 3} = \frac{5 + 4}{-3} = \frac{9}{-3} = -3 \\ b &= 5 \end{aligned}$$

$$\begin{aligned} &y = mx + b \\ &-4 = -3(3) + b \\ &-4 = -9 + b \end{aligned}$$

$$\begin{aligned} &-4 = -9 + b \\ &\quad +9 \quad +9 \\ &\quad \hline &5 = b \end{aligned}$$

$$\begin{aligned} &y = -3x + 5 \\ &\quad +3x \quad +3x \end{aligned}$$

$$\boxed{3x + y = 5}$$

7

Write the equation of the line in slope-intercept form that passes through the points (2, 4) and is perpendicular to the line $y + \frac{1}{4}x = 2$

$$m = 4$$

$$b = -4$$

$$y = 4x - 4$$

$$y = mx + b$$

$$4 = 4(2) + b$$

$$4 = 8 + b$$

$$\begin{array}{r} -8 \\ -8 \end{array}$$

$$-4 = b$$

because the lines are perpendicular, flip, and change the sign to get the slope of your line

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

$$\begin{array}{r} -\frac{1}{4}x \quad -\frac{1}{4}x \\ \hline y = -\frac{1}{4}x + 2 \end{array}$$

$$m = -\frac{1}{4}$$

- 14.) Are the following lines $l_1: 3y - 2x = -3$ and $l_2: 4y = 6x + 28$ parallel, perpendicular, or neither? EXPLAIN.

*must solve both for y (AKA, get both in slope-int form) to be able to identify the slopes

$$\begin{array}{r} 3y = 2x - 3 \\ \hline 3 \quad 3 \end{array}$$

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

$$m = \frac{2}{3}$$

$$\begin{array}{r} 4y = 6x + 28 \\ \hline 4 \quad 4 \end{array}$$

$$y = \frac{3}{2}x + 7$$

$$m = \frac{3}{2}$$

Neither

- Not parallel because their slopes are not identical
- Not perp because their slopes are reciprocals but not opposite signs

Given $f(x) = x^2 + 2$ and $g(x) = 2x - 1$ find the following:

15.) $f(-2)$

$$f(-2) = (-2)^2 + 2$$

$$= 4 + 2$$

$$= 6$$

16.) $g(-3)$

$$g(-3) = 2(-3) - 1$$

$$= -6 - 1$$

$$= -7$$

17.) $g(x) = 7$

$$2x - 1 = 7$$

$$\begin{array}{r} +1 \quad +1 \\ \hline \end{array}$$

$$2x = 8$$

$$\begin{array}{r} \div 2 \quad \div 2 \\ \hline \end{array}$$

$$x = 4$$

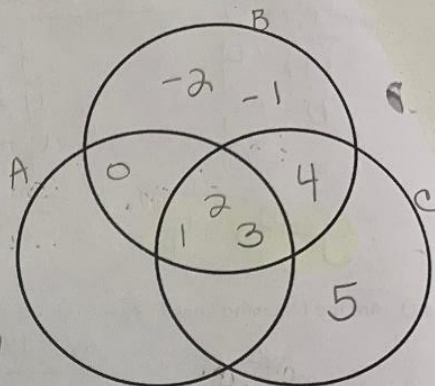
$A = \{0, 1, 2, 3\}$ $B = \{-2, -1, 0, 1, 2, 3, 4\}$ $C = \{1, 2, 3, 4, 5\}$
 Let $A = \{x | x \in W, -3 \leq x \leq 3\}$ $B = \{x | x \in Z, -2 \leq x \leq 4\}$ $C = \{x | x \in N, x \leq 5\}$ find the follo
 You may use the venn diagram provided if desired.

18.) $A \cap C = \{1, 2, 3\}$ OR $[1, 3]$

19.) $B' = \{5\}$

20.) $A \cup B = \{-2, -1, 0, 1, 2, 3, 4\}$ OR $[-2, 4]$

21.) $(B \cup C)' = \{5\}$ OR $\emptyset$



**Don't forget the 3!!!*

**DO NOT need to use the venn diagram, it's optional!*

22.) A line has a slope of $\frac{3}{4}$ and passes through the points $(7, -2)$ and $(x, -8)$. Find the missing value.

$m = \frac{3}{4}$
 $m = \frac{y_2 - y_1}{x_2 - x_1} \rightarrow \frac{3}{4} = \frac{-8 - (-2)}{x - 7} = \frac{-6}{x - 7} \rightarrow 3(x - 7) = 4(-6) \rightarrow 3x - 21 = -24 \rightarrow 3x = -3 \rightarrow x = -1$

23.) Graph $2x + 3y = 12$ by finding, plotting, and connecting the x and y intercepts. Use a ruler to create the line.

x-intercept $(6, 0)$

y-intercept $(0, 4)$

X int:

$y = 0$

$2x + 3(0) = 12$

$2x + 0 = 12$

$\frac{2x}{2} = \frac{12}{2}$

$x = 6$

xint:

$(6, 0)$

y int:

$x = 0$

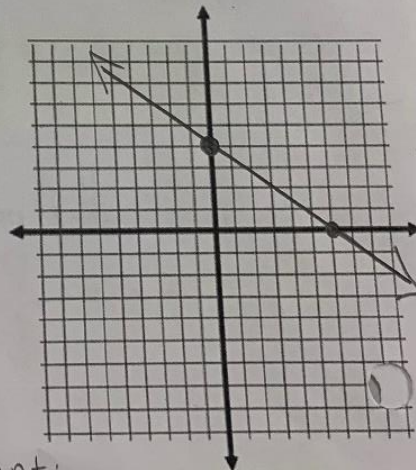
$2(0) + 3y = 12$

$0 + 3y = 12$

$\frac{3y}{3} = \frac{12}{3}$

$y = 4$

yint:
 $(0, 4)$

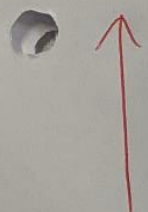


4

Graph $4x - 4y = 12$ by making a chart of x and y values. Show all work. Plot at least 4 points. Use a ruler to draw the line.

$$\begin{array}{r}
 4x - 4y = 12 \\
 -4x \qquad -4x \\
 \hline
 -4y = -4x + 12 \\
 -4 \qquad -4 \\
 \hline
 y = x - 3
 \end{array}$$

x	y
-2	-5 $\rightarrow (-2, -5)$
-1	-4 $\rightarrow (-1, -4)$
0	-3 $\rightarrow (0, -3)$
1	-2 $\rightarrow (1, -2)$
2	-1 $\rightarrow (2, -1)$
3	0 $\rightarrow (3, 0)$

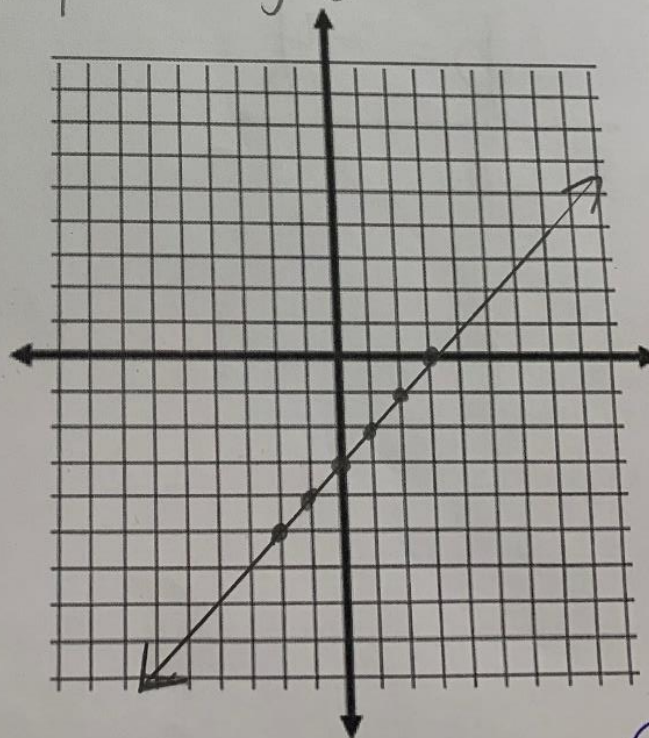


$x = 1$
 $y = 1 - 3$
 $y = -2$

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

$x = 3$
 $y = 3 - 3$
 $y = 0$

* you only need to find 4 points!
 I just did multiple to show more variety for you



25.) Graph $3y - 2x = -12$ using the slope and y-intercept. Plot at least 4 points. Use a ruler to create the line.

And state the slope and y-intercept

$$\begin{array}{r} 3y - 2x = -12 \\ +2x \quad +2x \\ \hline \end{array}$$

$$\begin{array}{r} 3y = 2x - 12 \\ \hline 3 \quad 3 \end{array}$$

$$y = \frac{2}{3}x - 4$$

$$m = \frac{2}{3}$$

$$b = -4$$

↑
I added this to the directions

