

M-G Geometry Week 17

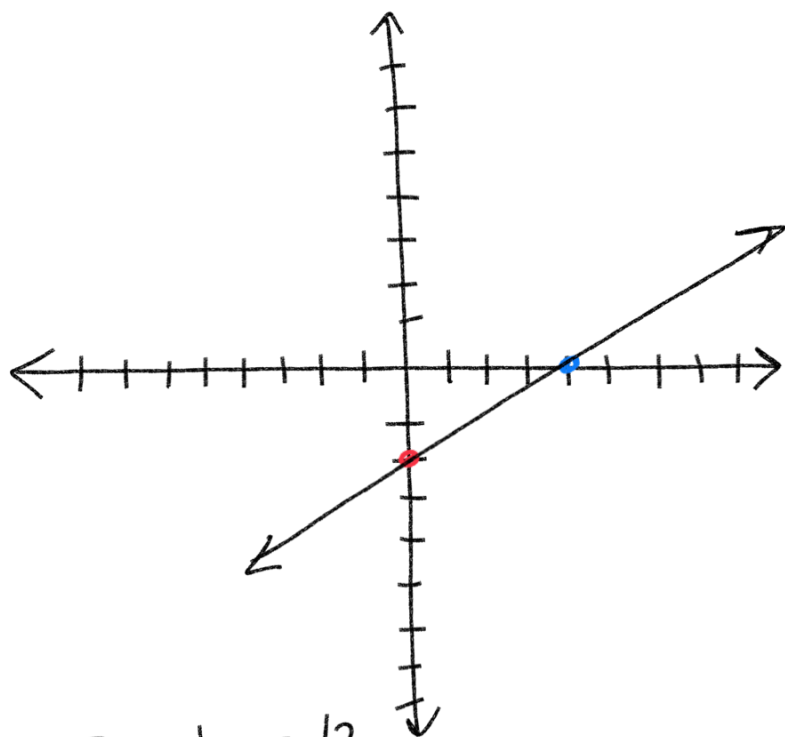
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Graph. Standard Form

$$3x - 6y = 12$$

$$\begin{aligned} \cancel{3}x - \cancel{6}y &= \frac{12}{-6} \\ x=0 \quad y &= -2 \quad (0, -2) \\ &\text{y-int} \end{aligned}$$

$$\begin{aligned} \frac{3x - \cancel{6}y}{3} &= \frac{12}{3} \\ y=0 \quad x &= 4 \quad (4, 0) \\ &\text{x-int} \end{aligned}$$



$$\begin{aligned} 3x - 6y &= 12 \\ -3x & \quad -3x \\ \hline -6y &= -3x + 12 \\ \frac{-6y}{-6} &= \frac{-3x}{-6} + \frac{12}{-6} \end{aligned}$$

slope-intercept $\rightarrow y = \frac{1}{2}x - 2$

Find the linear equation for the line parallel to

$4x - 12y = 24$ that goes through $(6, -3)$

Parallel lines \rightarrow have same slope.

Given: $\frac{1}{3}$

Needed: $\frac{1}{3}$
slope

$$\begin{aligned} 4x - 12y &= 24 \\ -4x & \quad -4x \end{aligned}$$

$$\begin{aligned} -12y &= -4x + 24 \\ \frac{-12y}{-12} &= \frac{-4x}{-12} + \frac{24}{-12} \end{aligned}$$

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

$$y = mx + b$$

$$\downarrow \quad \downarrow \quad \downarrow$$
$$-3 = \left(\frac{1}{3}\right)(6) + b$$

$$\begin{aligned} -3 &= 2 + b \\ -2 & \quad -2 \end{aligned}$$

$$-5 = b$$

$$y = mx + b \quad \left| \quad y = \frac{1}{3}x - 5 \right|$$

Find the linear equation for the line perpendicular to $y = -\frac{3}{4}x + 8$ that goes through $(6, -9)$

perpendicular lines \rightarrow have opposite inverse slopes

Given slope = $-\frac{3}{4}$ $-\frac{3}{4} \xrightarrow{\text{opposite}} \frac{3}{4} \xrightarrow{\text{inverse}} \frac{4}{3}$

Needed slope: $\boxed{\frac{4}{3}}$

$$\begin{array}{c} y = mx + b \\ \downarrow \downarrow \downarrow \\ -9 = \left(\frac{4}{3}\right)6 + b \end{array}$$

$$-9 = \frac{24}{3} + b$$

$$-9 = 8 + b$$

$$\begin{array}{r} -8 \quad -8 \\ \hline -17 = b \end{array}$$

$$\begin{array}{c} y = mx + b \\ \boxed{y = \frac{4}{3}x - 17} \end{array}$$

Geometry Chapter 3 Pre-Test

- 1.) (2 pts each, 10 pts total) Use the following illustration to define the relationship between each of the angles listed. Please include both the type of angles and whether they are congruent, supplemental, or complementary.

1.) vertical

2.) linear pairs

3.) corresponding

4.) Alternate Interior

5.) Same-side interior

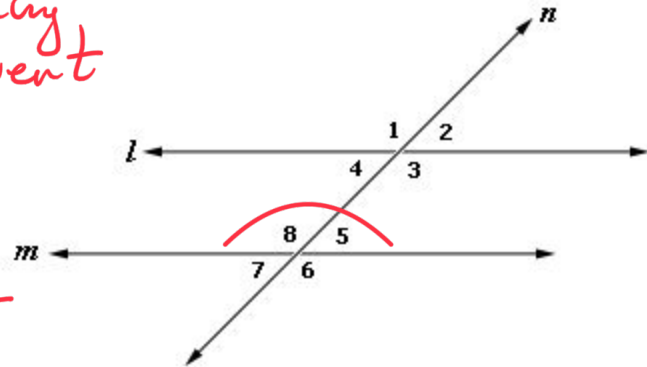
a) $\angle 1$ & $\angle 8$ corresponding congruent

b) $\angle 5$ & $\angle 7$

c) $\angle 4$ & $\angle 5$ Alt. interior congruent

d) $\angle 4$ & $\angle 8$

e) $\angle 5$ & $\angle 8$ Linear pair supplemental



- 2.) (10 pts) Find the value of x and y.

$$3x + 9 = 4y + 8$$

same-side interior

$$4y + 8 + 3y - 14 = 180$$

$$7y - 6 = 180$$

$$7y = 186$$

$$y = 26.6$$

vertical angles

$$3x + 9 = 4y + 8$$

$$\{ 3x + 9 = 4(26.6) + 8 \}$$

$$3x + 9 = 106.4 + 8$$

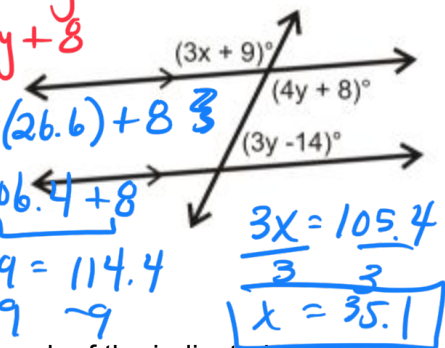
$$3x + 9 = 114.4$$

$$-9 \quad -9$$

$$3x = 105.4$$

$$\frac{3x}{3} = \frac{105.4}{3}$$

$$x = 35.1$$



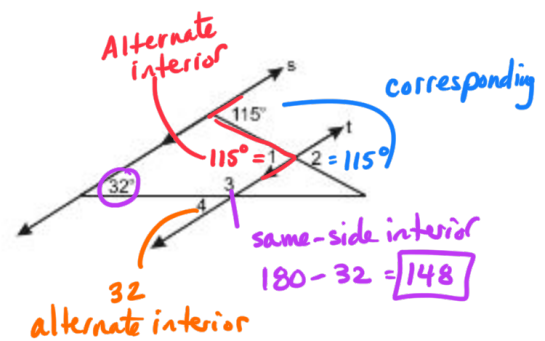
- 3.) (2.5 pts each, 10 pts total) Find the angle measure of each of the indicated angles.

a) $\angle 1$

b) $\angle 2$

c) $\angle 3$

d) $\angle 4$



4.) (5 pts each, 10 pts total) Use the properties of triangles to find the missing angles and/or variables.

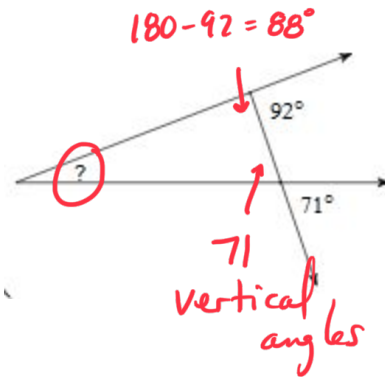
a) Find "?"

$$? + 88 + 71 = 180$$

$$? + 159 = 180$$

$$-159 \quad -159$$

$$\boxed{? = 21}$$



b) Find x

$$\boxed{18x + 3 + 70} + ? = 180$$

$$\boxed{127} + ? = 180$$

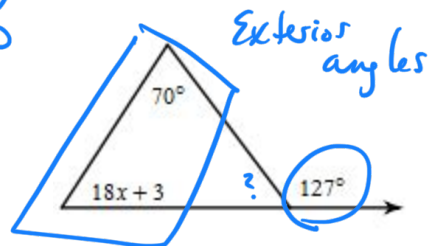
$$18x + 3 + 70 = 127$$

$$18x + 73 = 127$$

$$-73 \quad -73$$

$$\frac{18x}{18} = \frac{54}{18}$$

$$\boxed{x = 3}$$



5.) (5 pts each, 15 pts total) Answer each of the following using your understanding of polygons.

a) What is the total interior angle measure of a 15-sided regular polygon? What is the measure of each angle within the 15-sided regular polygon?

$n = \#$ of sides

$$180(15-2)$$

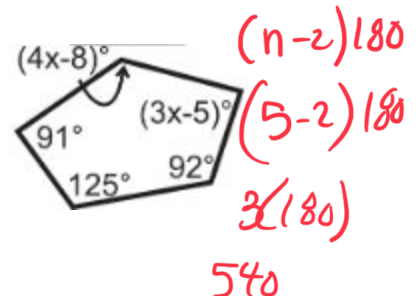
$$180(13) = \boxed{2340}$$

$$\frac{2340}{15} = \boxed{156}$$

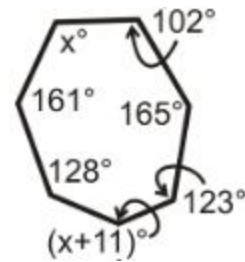
$$180(n-2)$$

b) Find x.

$$91 + 125 + 92 + 3x - 5 + 4x - 8 = 540$$



c) Find x.



6.) (5 pts each, 10 pts total) Find the slope of each of the following sets of ordered pairs.

a) (5, 3) (7, -5)

$$m = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-5 - 3}{7 - 5} = \frac{-8}{2} = \boxed{-4}$$

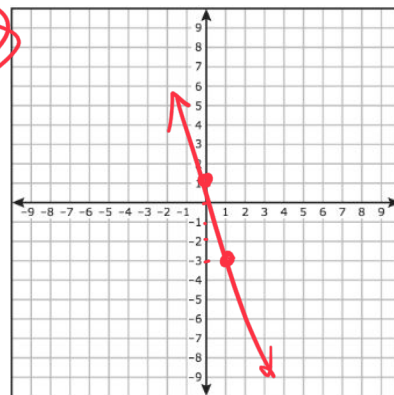
b) (8, -2) (2, 10)

7.) (5 pts) Write an equation for the line with the given slope that contains the given point.
Graph the line.

slope -4, (-1, 5)

$$\begin{aligned} y &= mx + b \\ \downarrow \quad \downarrow \quad \downarrow \\ 5 &= (-4)(-1) + b \\ 5 &= 4 + b \\ -4 \quad -4 \\ 1 &= b \end{aligned}$$

$$\boxed{y = -4x + 1}$$



8.) (5 pts each, 10 pts total) Write the equation for the line containing the given points in ~~both point slope and slope-intercept forms~~. Graph each line.

a) $(-3, 4)$ $(6, 1)$

1.) Find slope

2.) Find $y = mx + b$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{4 - 1}{-3 - 6} = \frac{3}{-9} = -\frac{1}{3}$$

$$y = mx + b$$

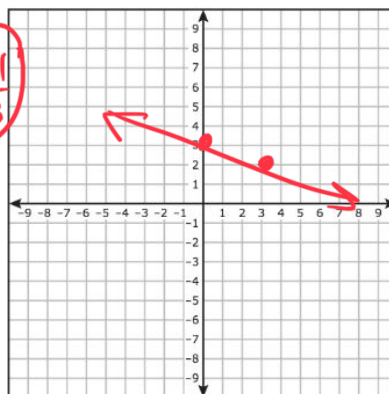
$$1 = \left(-\frac{1}{3}\right)(6) + b$$

$$1 = -2 + b$$

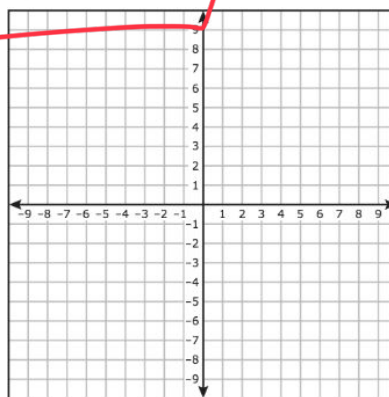
$$+2 \quad +2$$

$$3 = b$$

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



b) $(7, -2)$ $(-1, 2)$



9.) (5 pts each, 10 pts total) Graph each line.

a) $2x - 4y = 12$

$$2x - 4y = 12$$

$$\frac{2x}{2} - \frac{4y}{4} = \frac{12}{4}$$

$$x - y = 3$$

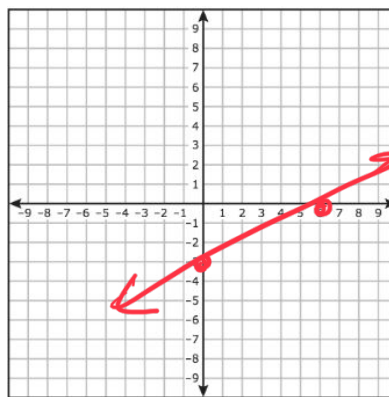
$$x = 0 \quad y = -3 \quad (0, -3)$$

$$2x - 4y = 12$$

$$\frac{2x}{2} - \frac{4y}{4} = \frac{12}{2}$$

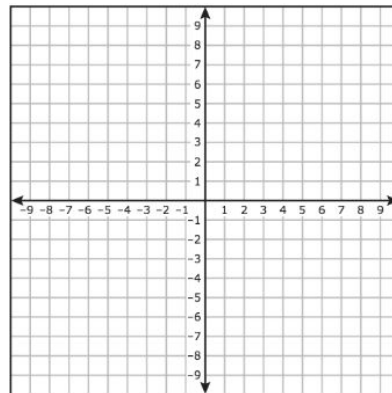
$$x - y = 6$$

$$y = 0 \quad x = 6 \quad (6, 0)$$



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

$y = mx + b$



10.) (5pts each, 10 pts total) Write the specified equation.

- a) Write an equation for the line perpendicular to the line $y = \frac{3}{2}x + 5$ that contains the point $(-6, 3)$.

Needed slope $\rightarrow -\frac{2}{3}$

$$\begin{aligned}
 y &= mx + b \\
 \downarrow \quad \downarrow \quad \downarrow \\
 3 &= \left(-\frac{2}{3}\right)(-6) + b \\
 3 &= 4 + b \quad b = -1 \\
 -4 \quad -4
 \end{aligned}$$

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

- b) Write an equation for the line parallel to the line $12x + 3y = 6$ that contains the point $(1, -2)$.