Math 12 – Workshop #5

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1. Which quadrant are the following points located in?

   (a) $(1, 2)$

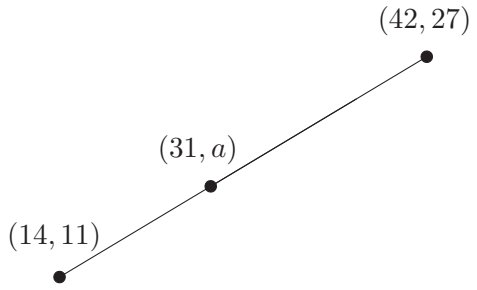
   (b) $(e, -3)$

   (c) $(-1, \pi)$

   (d) $\left(-\frac{2}{3}, -\frac{1}{2}\right)$

2. Suppose a is a real number, were could you find the point $(-1, a)$?

3. Consider the line segment



   (a) Find the midpoint of the line segment

   (b) Find the slope of the line segment

   (c) Find a

4. Find the slopes and y intercepts of the following lines

   (a) $y = \frac{2}{7}x - 6$ (b) $y = 1 - 2x$ (c) $2x + 3y = 1$

   Determine the slope of a line perpendicular to each of the three lines above.

5. Give the equation of a line with slope -4 which passes through the point $(1, 7)$. What is the y intercept of this line?

6. (a) Find the equation for the line passing through the points $(1, 2)$ and $(13, 7)$.

   (b) Is the point $(25, 12)$ above, below or on the line?

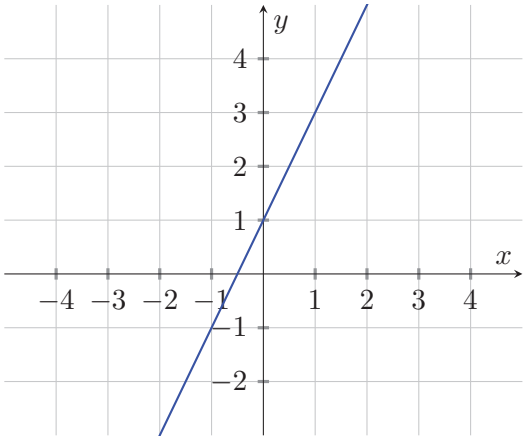
   (c) Is the point $(-20, -7)$ above, below or on the line?

7. Consider the line passing through the points $(3, 5)$ and $(-1, 9)$. We will call this line L

   (a) Find a parallel line to L which passes through the point $(7, 10)$.

   (b) Find a perpendicular line to L which passes through the midpoint of $(3, 5)$ and $(-1, 9)$.

8. The following line is given by the equation $y = 2x + 1$. Consider a point (x, y) on the line.



Consider a point (x, y) on the line.

(a) For which x value is $y = 0$?

(b) For which x values is y positive?

(c) For which y values is x negative?

9. Surprisingly, the world population between 1961 and 2010 can be modeled by the equation

$$y = 0.0809534x + 2.96565$$

where x is years after 1961 and y is in billions of people.

(a) What is the y intercept of this line? In a complete sentence explain the significance of the y intercept.

(b) What does this model say the world population was in 1980?

(c) What does this model predict the world population will be in 2020?

(d) In which year does this model predict the worlds population will reach 8.6 billion?