Group Members

NOTE: Some of these exercises are borrowed or adapted from <u>Beginning Algebra</u> by Elayn Martin-Gay.

1. Write an equation with the given slopes and y-intercepts.

   (a) $m = 5$; y-intercept $(0, 3)$ $y = 5x + 3$
   (b) $m = \frac{-4}{5}$; y-intercept $(0, 0)$ $y = -\frac{4}{5}x$
   (c) $m = \frac{6}{7}$; y-intercept $(0, \frac{1}{3})$ $y = \frac{6}{7}x + \frac{1}{3}$

2. Find an equation of each line with the given slope that passes through the given point. Write the equation in standard form.

   (a) $m = 6$; $(2, 2)$ $6x - y = 10$
   (b) $m = \frac{3}{2}$; $(5, -6)$ $3x - 2y = 27$
   (c) $m = \frac{-1}{2}$; $(-3, 0)$ $x + 2y = -3$
   (d) $m = \frac{41}{11}$; $(-4, 12)$ $41x - 11y = -296$

3. Find an equation of the line passing through each pair of points. Write the equation in standard form.

   (a) $(3, 2)$ and $(5, 6)$ $2x - y = 4$
   (b) $(6, 2)$ and $(8, 8)$ $3x - y = 16$
   (c) $(2, 3)$ and $(-1, -1)$ $4x - 3y = -1$
   (d) $(7, 10)$ and $(-1, -1)$ $11x - 8y = -3$

4. Find an equation of each line:

   (a) a vertical line through $(0, 2)$ $x = 0$
   (b) a horizontal line through $(\frac{2}{7}, 0)$ $y = 0$
   (c) a vertical line through $(\frac{7}{3}, -\frac{2}{5})$ $x = \frac{7}{3}$

5. In 2006, the US population density was 85 persons per square mile. In 2000, the density was 79.6.

   (a) Write a linear equation describing the relationship between year and density. Use ordered pairs of the form (years past 2000, density). $(0, 79.6)$ $(6, 85)$

   $$y = .9x + 79.6$$

   (b) Use the equation from (a) to predict the density in 2010.

   $$88.6$$

6. Sam, a very diligent student, has been keeping track of the hours she has been studying for her math class. For exam one she studied 4 hours and earned a 70% and for exam two she studied for 8 hours and she earned an 75%.

   (a) Supposing (probably falsely) that the relationship between studying and exam score is linear, write an equation which relates Sam's hours studied to exam percentage.

   $$y = \frac{5}{4}x + 65$$

(b) Using the relationship found in (a), approximate Sam's grade on exam 3 if she studies for 12 hours.

$$80\%$$

(c) Write a few sentences explaining the limitations of the model found in (a). What sort of curve might be a better approximation of the relationship between hours of studying and score earned? (Just think about your own study habits - there is no correct answer here)

7. Consider the point $(4, 0)$.

(a) Write an equation of a line that contains the aforementioned point and is parallel to the line $y = -2x + 3$.

$$y = -2x + 8$$

(b) Write an equation of a line that contains the point and is perpendicular to the line $y = -2x + 3$.

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

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