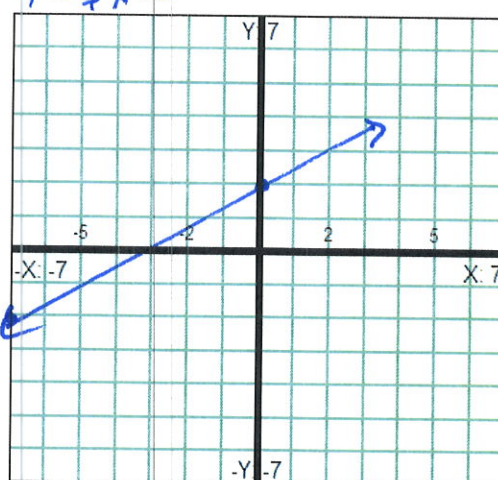
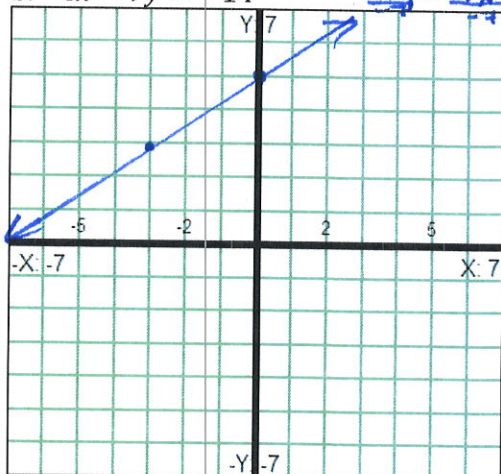


1. Use the slope-intercept form to graph the lines.

a.  $y = \frac{2}{3}x + 5$

b.  $4x - 7y = -14$



2. Write an equation of a line with given slope and y-intercept.

a.  $m = 5, b = 3$   $y = 5x + 3$

b.  $m = -4, b = -\frac{1}{6}$   $y = -4x - \frac{1}{6}$

c.  $m = \frac{2}{3}, b = 0$   $y = \frac{2}{3}x$

d.  $m = 0, b = -8$   $y = -8$

e.  $m = \frac{1}{2}, b = -\frac{1}{3}$   $y = \frac{1}{2}x - \frac{1}{3}$

3. Write an equation of the line with given slope passing through the given point. Begin in point-slope form  $y - y_1 = m(x - x_1)$  and solve the equation for standard form  $Ax + By = C$ .

a.  $m = 6, (2, 2)$   $y - 2 = 6(x - 2) \Rightarrow y - 2 = 6x - 12 \Rightarrow y = 6x - 10 \Rightarrow -6x + y = -10$

b.  $m = -2, (-11, -12)$   $y - (-12) = -2(x - (-11)) \Rightarrow y + 12 = -2x - 22 \Rightarrow y = -2x - 34 \Rightarrow 2x + y = -34$

c.  $m = \frac{2}{3}, (-8, 9)$   $y - 9 = \frac{2}{3}(x - (-8)) \Rightarrow y - 9 = \frac{2}{3}x + \frac{16}{3} \Rightarrow y = \frac{2}{3}x + \frac{43}{3} \Rightarrow -2x + 3y = 43$

d.  $m = -\frac{1}{2}, (-3, 0)$   $y - 0 = -\frac{1}{2}(x - (-3)) \Rightarrow y = -\frac{1}{2}x - \frac{3}{2} \Rightarrow x + 2y = -3$

e. vertical line,  $(0, 2)$   $x = 0$

f. horizontal line,  $(1, 4)$   $y = 4$

g. vertical line,  $(-\frac{7}{3}, -\frac{2}{5})$   $x = -\frac{7}{3}$

h. horizontal line,  $(-1, 3)$   $y = 3$

4. Write an equation of the line passing through the given points. Begin in point-slope form  $y - y_1 = m(x - x_1)$  and solve the equation for standard form  $Ax + By = C$ .

a.  $(3, 2), (5, 6)$   $\frac{6-2}{5-3} = \frac{4}{2} = 2$   $y-2 = 2(x-3) \Rightarrow y-2 = 2x-6 \Rightarrow y = 2x-4 \Rightarrow -2x+y = -4$

b.  $(-1, 3), (-2, -5)$   $\frac{-5-3}{-2-(-1)} = \frac{-8}{-1} = 8$   $y-3 = 8(x+1) \Rightarrow y-3 = 8x+8 \Rightarrow y = 8x+11 \Rightarrow -8x+y = 11$

c.  $(2, 3), (-1, -1)$   $\frac{-1-3}{-1-2} = \frac{-4}{-3} = \frac{4}{3}$   $y-3 = \frac{4}{3}(x-2) \Rightarrow y-3 = \frac{4}{3}x - \frac{8}{3} \Rightarrow y = \frac{4}{3}x + \frac{1}{3} \Rightarrow -4x+3y = 1$

d.  $(0, 0), (-\frac{1}{8}, \frac{1}{13})$   $\frac{\frac{1}{13}-0}{-\frac{1}{8}-0} = \frac{\frac{1}{13}}{-\frac{1}{8}} = \frac{1}{13} \cdot -\frac{8}{1} = -\frac{8}{13}$   $y-0 = -\frac{8}{13}(x-0) \Rightarrow y = -\frac{8}{13}x \Rightarrow 8x+13y = 0$

5. Find a line parallel and a line perpendicular to the given line passing through the indicated point.

a.  $y = 5, (1, 2)$   $y = 2$  ;  $x = 1$

b.  $x = -3, (-2, 5)$   $x = -2$  ;  $y = 5$

c.  $y = -6x, (6, -8)$   $m = -6$   $y - (-8) = -6(x-6) \Rightarrow y+8 = -6x+36 \Rightarrow y = -6x+28$  ;  $m = \frac{1}{6}$   $y+8 = \frac{1}{6}(x-6) \Rightarrow y+8 = \frac{1}{6}x - 1 \Rightarrow y = \frac{1}{6}x - 9$

d.  $3x - 4y = 4, (1, -5)$   $\Rightarrow \frac{-4y}{-4} = \frac{-3x+4}{-4} \Rightarrow y = \frac{3}{4}x - 1$   $m = \frac{3}{4}$   
 $y+5 = \frac{3}{4}(x-1) \Rightarrow y+5 = \frac{3}{4}x - \frac{3}{4} \Rightarrow y = \frac{3}{4}x - \frac{23}{4}$

$y+5 = -\frac{4}{3}(x-1) \Rightarrow y+5 = -\frac{4}{3}x + \frac{4}{3} \Rightarrow y = -\frac{4}{3}x - \frac{11}{3}$

6. Sales of hybrid vehicles have been decreasing. In 2007, 356 thousand new hybrid vehicles were in the US. In 2009, only 290 thousand were sold. Write an equation describing the relationship between hybrid vehicle sales and time. Use points of the form (year, number of hybrids sold). If the trend holds, how many hybrids will be sold in 2016?

$$(2007, 356), (2009, 290)$$

$$\frac{290 - 356}{2009 - 2007} = \frac{-66}{2} = -33$$

$$y - 290 = -33(x - 2009)$$

$$y - 290 = -33x + 66,587 \Rightarrow y = -33x + 66,587 + 290$$

$$y = -33(2016) + 66,587 = 59 \text{ thousand}$$

7. In 2006, the US population per square mile of land area was 85. In 2011, the same figure was 88. Write an equation describing the relationship between persons per land area and time. Use ordered pairs of the form (years since 2006, person per square mile). How many people per square mile would this equation predict in 2020?

$$(2006, 85), (2011, 88)$$

$$\frac{88 - 85}{2011 - 2006} = \frac{3}{5}$$

$$y - 85 = \frac{3}{5}(x - 2006)$$

$$y - 85 = \frac{3}{5}x - 1,203.6 \Rightarrow y = \frac{3}{5}x - 1,118.6$$

$$y = \frac{3}{5}(2020) - 1,118.6 = 93.4$$

8. For each equation, state which form of a line it is.

a.  $y - 7 = 4(x + 3)$  point-slope

b.  $5x - 9y = 11$  standard

c.  $y = \frac{3}{4}x - \frac{1}{3}$  slope-intercept

d.  $y = \frac{1}{2}$  horizontal

e.  $x = -17$  vertical