

#6 $\frac{1}{7}x - \frac{1}{3}y = 1$

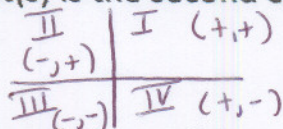
MAT0024 Test 3

Name Key

D. Howard 3-16

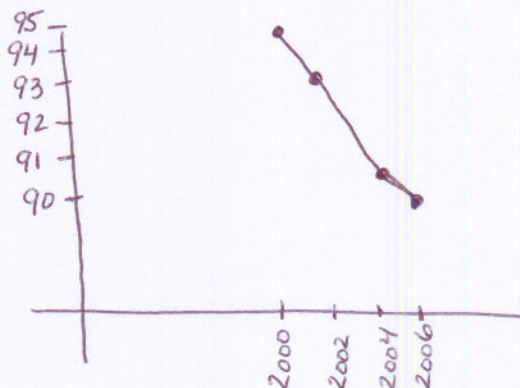
1. In which quadrant(s) is the second coordinate negative?

III & IV



2. The table contains real data of the number of farms F in thousands during year x. Make a line graph of the data. Be sure to label the axes with appropriate scale.

x	2000	2002	2004	2006
F	95	93	91	90



3. Find three ordered pairs to the equation $y = 11x$.

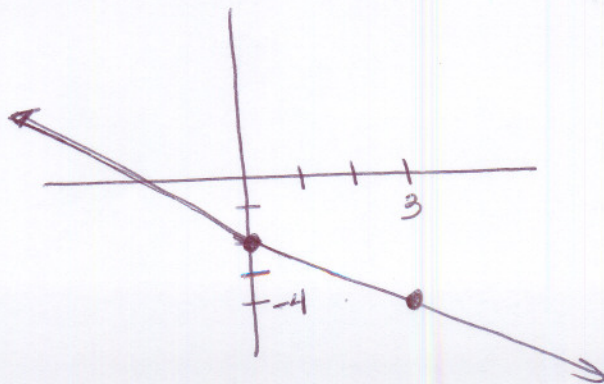
many answers possible!

x	y = 11x
0	0
1	11
2	22

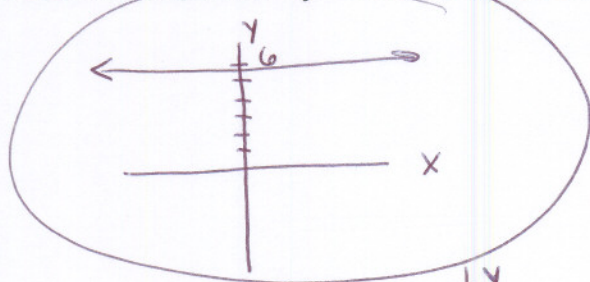
(0,0), (1,11), (2,22)

4. Graph the line with slope $-\frac{2}{3}$ and passes through the point (0, -2). Be sure to label the axes with appropriate scale.

$m = -\frac{2}{3} \Rightarrow$ down 2, right 3
from (0, -2)



5. Graph the equation $y = 6$. Be sure to label the axes with appropriate scale.



6. Given the equation $\frac{1}{7}x - \frac{1}{3y} = 1$.

a.) Find the coordinates of the x-intercept. let $y = 0$

$$\frac{1}{7}x - \frac{1}{3}(0) = 1$$

$$7 \cdot \frac{1}{7}x = 1 \cdot 7$$

$$x = 7$$

$$(7, 0)$$

b.) Find the coordinates of the y-intercept. let $x = 0$

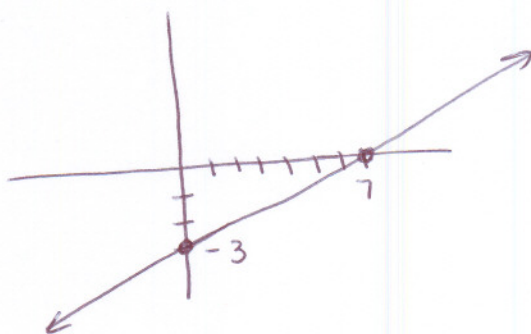
$$\frac{1}{7}(0) - \frac{1}{3}y = 1$$

$$(-3)\left(-\frac{1}{3}\right)y = 1(-3)$$

$$y = -3$$

$$(0, -3)$$

c.) Sketch a graph of the equation. Be sure to label the axes with appropriate scale.



7. Write an equation of a line with slope -2 and passes through the point (0, -5).

$$y = mx + b \quad ; \quad m = -2 \quad b = -5$$

$$y = -2x - 5$$

8. Write an equation of a line which passes through the points (0,4) and (-5,0).

$$y = mx + b \quad ; \quad m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{0 - 4}{-5 - 0} = \frac{-4}{-5} = \frac{4}{5}$$

$b = 4$

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

9. Write an equation of a line with slope 4 and passes through the point (1,1).

$$y = mx + b \quad m = 4 \quad \begin{matrix} x \\ y \\ (1, 1) \end{matrix}$$

we do not know "b"!

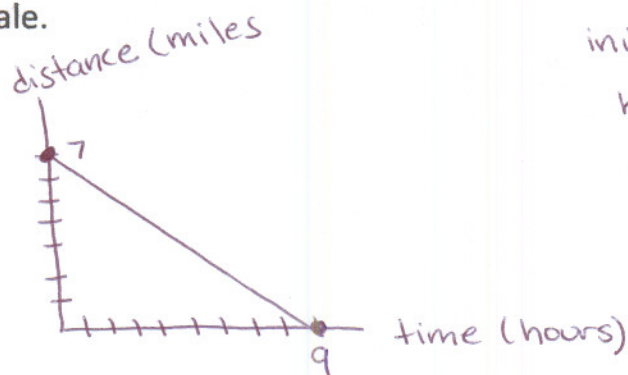
$$1 = 4(1) + b$$

$$1 = 4 + b$$

$$\begin{array}{r} -4 \\ \hline -3 = b \end{array}$$

$$y = 4x - 3$$

10. Sketch the graph that models the given situation. The distance that a boat is from a harbor if the boat is initially 7 miles from the harbor and arrives at the harbor after sailing at a constant speed for 9 hours. Be sure to label the axes with appropriate scale.



initially 7 mi $\Rightarrow (0, 7)$

harbor in 9 hours $\Rightarrow (9, 0)$

constant speed \Rightarrow linear

11. Given $x = 5y - 7$.

a.) Write the equation in $y = mx + b$ form.

$$\begin{array}{r} x = 5y - 7 \\ +7 \qquad +7 \\ \hline x + 7 = 5y \\ \frac{x+7}{5} = \frac{5y}{5} \end{array} \quad \Rightarrow \quad \boxed{\frac{1}{5}x + \frac{7}{5} = y}$$

b.) Find the coordinates of the y-intercept.

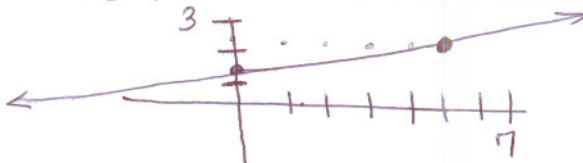
$$\boxed{\left(0, \frac{7}{5}\right)}$$

$$b = \frac{7}{5}$$

c.) Find the slope.

$$\boxed{m = \frac{1}{5}}$$

d.) Sketch a graph. Be sure to label the axes with appropriate scale.



$m = \frac{1}{5} \Rightarrow$ up 1, right 5
from $(0, \frac{7}{5})$

12. From 1985 to 2000, the percent P of total music sales with a certain format is modeled by $P = 5.8t - 11507$, where t is the year.

a.) State the slope of the equation.

$$\boxed{m = 5.8}$$

b.) Interpret the meaning of the slope in the context of the problem.

$$m = \frac{5.8 \text{ percent of music sales}}{1 \text{ year}}$$

\Rightarrow Increase of 5.8% in music sales each year.

c.) What was the percent of music sales for the year 2000?

$$\begin{array}{r} 5.8 \\ \times 2000 \\ \hline 116000 \end{array}$$

$$P = 5.8(2000) - 11507$$

$$P = 11600 - 11507$$

$$\boxed{P = 93\%}$$

$$\begin{array}{r} 11600 \\ - 11507 \\ \hline 93 \end{array}$$

d.) In what year was $P = 64\%$?

$$\begin{array}{r} 64 = 5.8x - 11507 \\ + 11507 \qquad \qquad + 11507 \end{array}$$

$$\frac{11571}{5.8} = \frac{5.8x}{5.8}$$

$$\boxed{1995 = x}$$

$$\begin{array}{r} 1995. \\ 5.8 \overline{) 115710} \\ \underline{- 58} \\ 577 \\ \underline{- 522} \\ 551 \\ \underline{- 522} \\ 290 \\ \underline{- 290} \\ 0 \end{array}$$