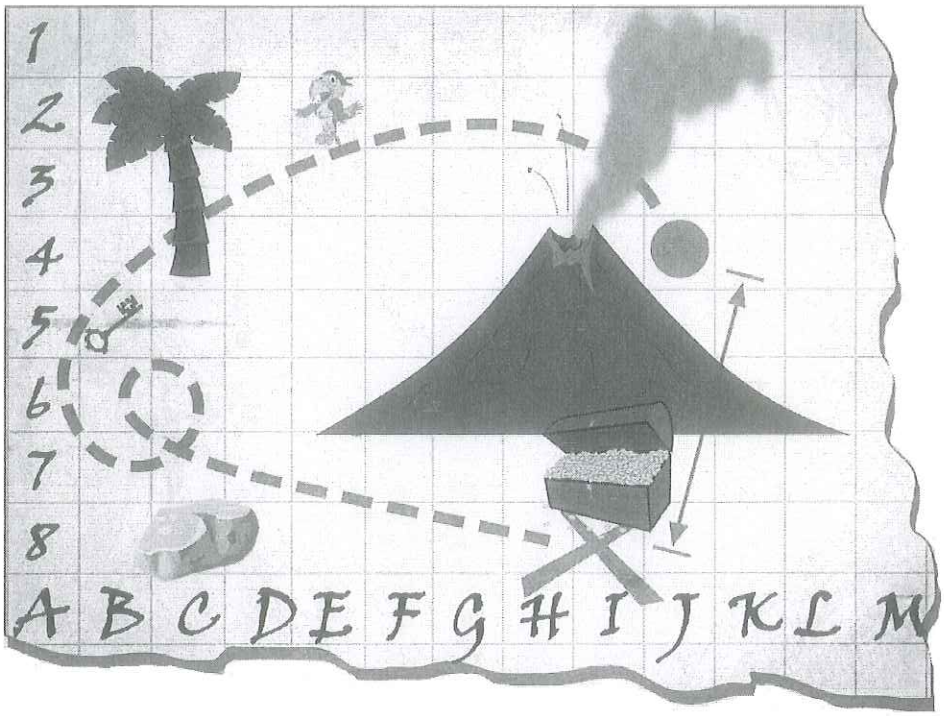
Math 60, Sections 4.1 and 4.2 Notes and Practice Name: Solutions

Section 4.1 Cartesian Coordinates

1. Write the location of each item on the map using a letter-number pair.



a. Starting point J4 or (J,4)

b. Parrot E2 or (E,2)

c. Palm Tree C4, C3, C2, B2

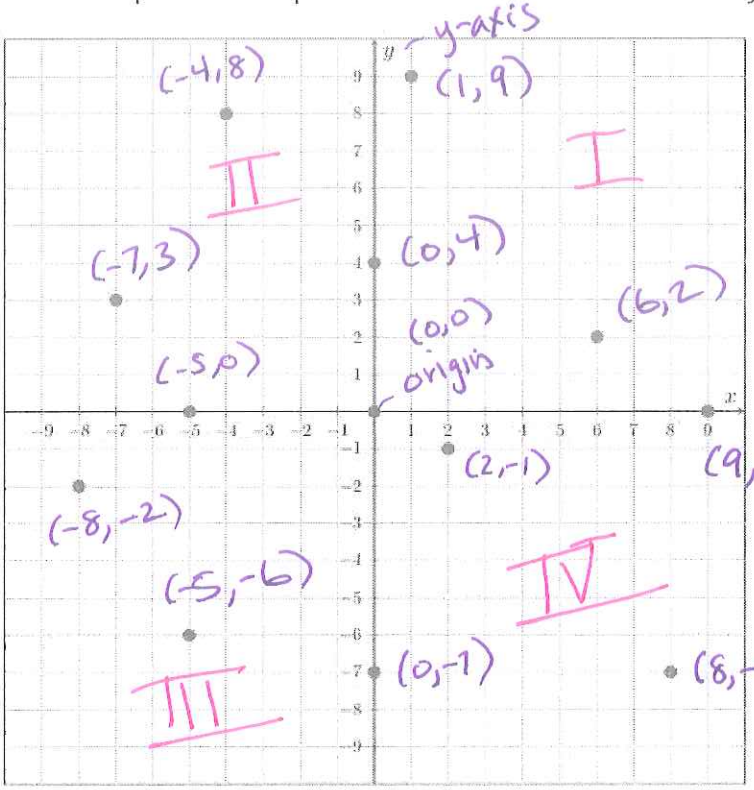
d. Key B5

e. Rock C8

f. Treasure Chest I8, I7, I7.5

The Cartesian Coordinate System for Two Variables

2. Label the ordered pair of each point on the Cartesian coordinate system.



4-Quadrants

ordered pair (x,y)

The grid shown below is known as the Cartesian coordinate system or the rectangular coordinate system.

- A point is represented as an ordered pair, (x, y)
- The horizontal axis is called the x-axis
- The vertical axis is called the y-axis
- There are four quadrants labeled counter clockwise: I, II, III, IV
- The point $(0,0)$ is called the origin
- The scale is the width of each space on the graph

3. Label the axes, scale, and quadrants of the graph.

4. Draw a dot at each of the following coordinates and write which quadrant the point is in, or which axis it is on.

a. $(4,5)$ I

b. $(-1,3)$ II

c. $(-5,-6)$ III

d. $(4,-7)$ IV

e. $(7,0)$ x-axis

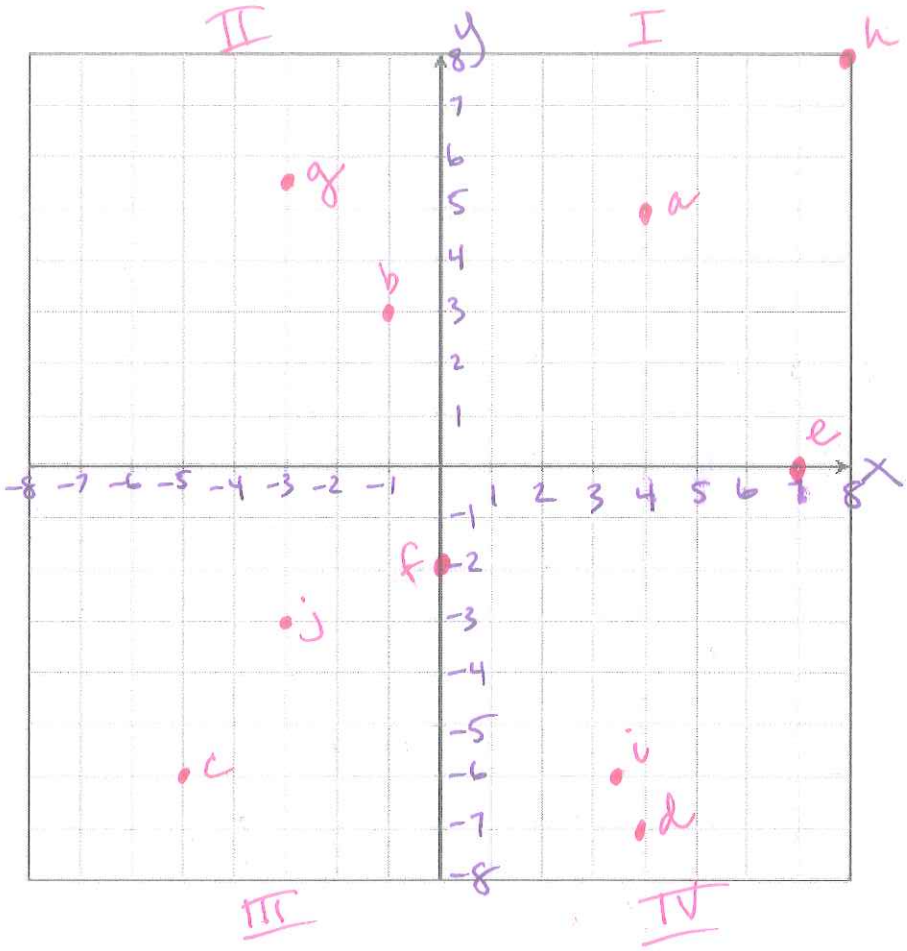
f. $(0,-2)$ y-axis

g. $(-3,5.5)$ II

h. $(8,8)$ I

i. $\left(3\frac{1}{2},-6\right)$ IV

j. $(-3,-3)$ III



5. For each of the following conditions, state which quadrant the point would be in, or which axis the point would be on.

a. $x > 0$ and $y < 0$ IV

b. $x > 0$ and $y = 0$ x-axis

c. $x < 0$ and $y < 0$ III

Quadrant I
$x > 0$ and $y > 0$

Quadrant II
$x < 0$ and $y > 0$

6. Jamie charged $250 on a 0%-interest-for 6-month credit card. They decided to pay $50 per month until the balance is paid off, and then keep saving that amount in a savings account (we will ignore any interest for the time being.)

a. Complete the table for Jamie's balance each month.

b. Using a horizontal scale of 1 for months and a vertical scale of $50, plot Jamie's balance on the graph. Label the axes and scale.

Month x	Current Balance (Owed or Saved) y
0	$y =$ -250
1	$y =$ -200
2	$y =$ -150
3	$y =$ -100
4	$y =$ -50
5	$y =$ 0
6	$y =$ 50
7	$y =$ 100
8	$y =$ 150
x	$y =$ -250+50x

Let x = the # of months



c. Write a few ordered pairs that represent solutions to the linear model. Then ~~draw a line to graph all~~ solutions of the equation.

(0,-250) (1,-200) (2,-150)
In this context it doesn't make sense to connect the dots. It is discrete.

$y = -250 + 50x$

d. Determine whether the following ordered pairs are solutions to the equation.

(10,250) yes (x, y)
$250 \stackrel{?}{=} -250 + 50(10)$
$250 \stackrel{?}{=} -250 + 500$
$250 = 250$ ✓

(−1,−300) yes
$-300 \stackrel{?}{=} -250 + 50(-1)$
$-300 = -250 - 50$
$-300 = -300$ ✓

(1.5,−175) yes

(5,25) (x, y)
$25 \stackrel{?}{=} -250 + 50(5)$
$25 = -250 + 250$
$25 \neq 0$
not a solution

7. Determine whether the following ordered pairs are solutions to the equation $2x+5y=20$

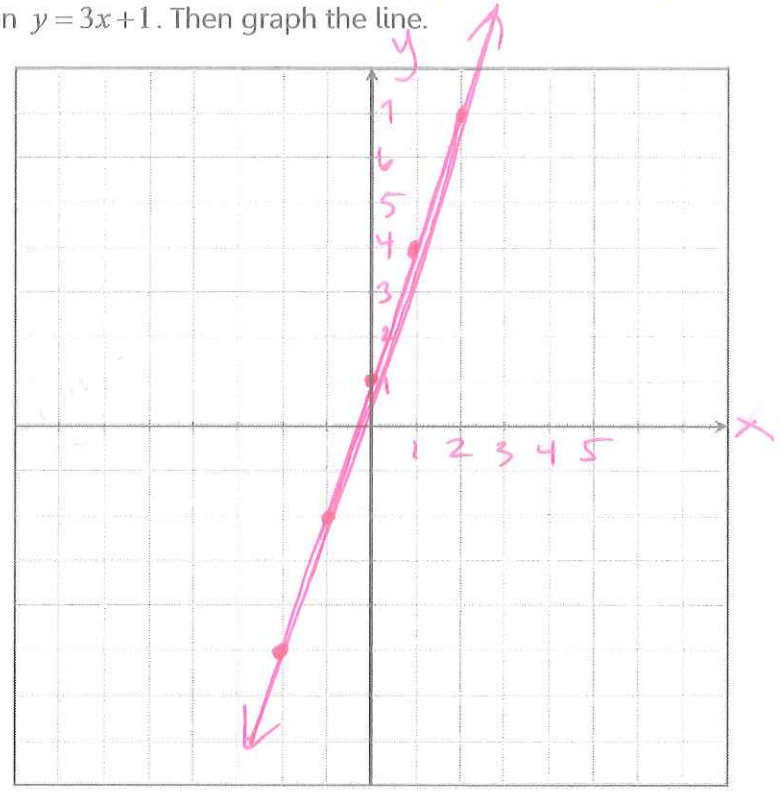
$(0,4)$ (x y) ?
$2(0)+5(4)=20$
$0+20=20$ ✓
$(0,4)$ is a solution

$(-5,6)$ (x y) ?
$2(-5)+5(6)=20$
$-10+30=20$ ✓
$(-5,6)$ is a solution

$(2,3)$?
$2(2)+5(3)=20$
$4+15=20$
$19=20$ ✗
$(2,3)$ is not a solution

8. Make a table of solutions to the linear equation $y=3x+1$. Then graph the line.

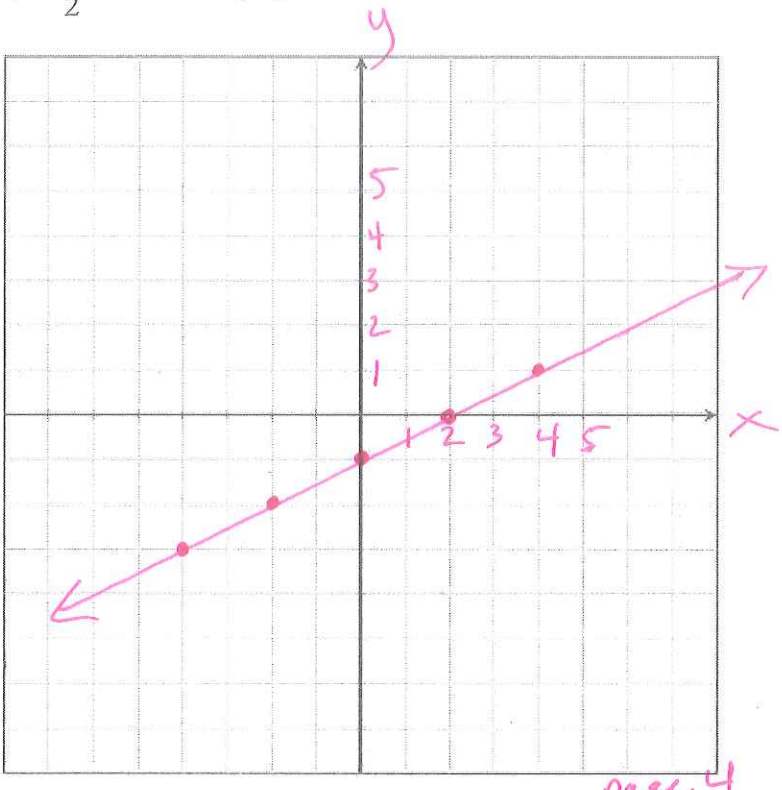
x	$y=3x+1$	(x,y)
-2	$y=3(-2)+1=-5$	$(-2,-5)$
-1	$y=3(-1)+1=-2$	$(-1,-2)$
0	$y=3(0)+1=1$	$(0,1)$
1	$y=3(1)+1=4$	$(1,4)$
2	$y=3(2)+1=7$	$(2,7)$



9. Make a table of solutions to the linear equation $y=\frac{1}{2}x-1$. Then graph the line.

even numbers

x	$y=\frac{1}{2}x-1$	(x,y)
-4	$y=\frac{1}{2}(-4)-1=-2-1=-3$	$(-4,-3)$
-2	$y=\frac{1}{2}(-2)-1=-1-1$	$(-2,-2)$
0	$y=\frac{1}{2}(0)-1=-1$	$(0,-1)$
2	$y=\frac{1}{2}(2)-1=1-1=0$	$(2,0)$
4	$y=\frac{1}{2}(4)-1=2-1=1$	$(4,1)$



More Practice

10. Draw a dot at each of the following coordinates and write which quadrant the point is in, or which axis it is on.

a. $(-6,0)$ x-axis

b. $(4,-2)$ IV

c. $(-3,3)$ II

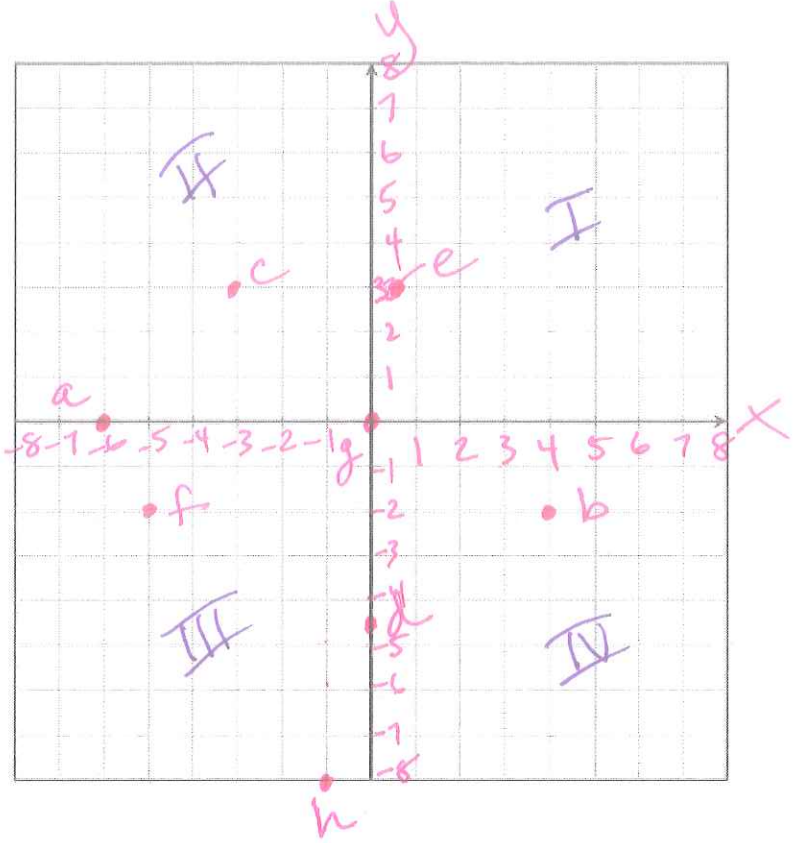
d. $(0,-4.5)$ y-axis

e. $\left(\frac{1}{2},3\right)$ I

f. $(-5,2)$ II

g. $(0,0)$ origin

h. $(-1,-8)$ III



11. Determine whether the following ordered pairs are solutions to the equation $y=-3x+6$

$(1,3)$ (x, y)

$3 \stackrel{?}{=} -3(1)+6$

$3 \stackrel{?}{=} -3+6$

$3=3$ ✓

(1,3) is a solution

$(-1,-3)$

$-3 \stackrel{?}{=} -3(-1)+6$

$-3 \stackrel{?}{=} 3+6$

$-3 \neq 9$

(-1,-3) is not a solution

$(2,0)$

$0 \stackrel{?}{=} -3(2)+6$

$0 = -6+6$

$0=0$ ✓

(2,0) is a solution

12. Determine whether the following ordered pairs are solutions to the equation $y=-\frac{2}{3}x+4$

$(3,-6)$ (x, y)

$-6 \stackrel{?}{=} -\frac{2}{3}\left(\frac{3}{1}\right)+4$

$-6 \stackrel{?}{=} -2+4$

$-6 \neq 2$

(3,-6) is not a solution

$(-3,6)$

$6 \stackrel{?}{=} -\frac{2}{3}\left(\frac{-3}{1}\right)+4$

$6 \stackrel{?}{=} -6+4$

$6 \neq -2$

(-3,6) is not a solution

$(0,4)$

$4 \stackrel{?}{=} -\frac{2}{3}(0)+4$

$4=4$ ✓

(0,4) is a solution

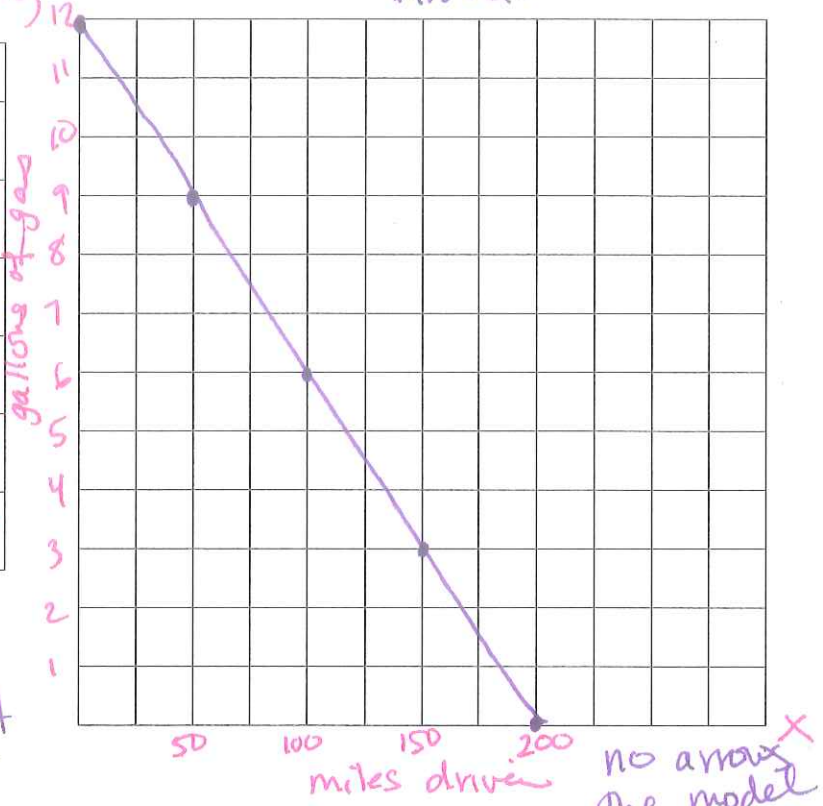
13. A car's gas tank holds 12 gallons of gas. The car uses fuel at an average rate of $0.06\frac{\text{gal}}{\text{mile}}$. Make a table of solutions to the linear equation $y = 12 - 0.06x$. Then graph the line.

Hint: Choose your x-values wisely☺

amount of gas → ← # of miles driven

First Quadrant graph

x	$y = 12 - 0.06x$	(x, y)
0	$y = 12 - .06(0) = 12$	(0, 12)
50	$y = 12 - .06(50) = 12 - 3 = 9$	(50, 9)
100	$y = 12 - .06(100) = 12 - 6 = 6$	(100, 6)
150	$y = 12 - .06(150) = 12 - 9 = 3$	(150, 3)
200	$y = 12 - .06(200) = 12 - 12 = 0$	(200, 0)
~~250~~		



out of gas

no arrows the model stops

Continuous context – it makes sense to connect the points.

14. Make a table of solutions to the linear equation $y = -4x$. Then graph the line.

x	$y = -4x$	(x, y)
−2	$y = -4(-2) = 8$	(−2, 8)
−1	$y = -4(-1) = 4$	(−1, 4)
0	$y = -4(0) = 0$	(0, 0)
1	$y = -4(1) = -4$	(1, −4)
2	$y = -4(2) = -8$	(2, −8)

