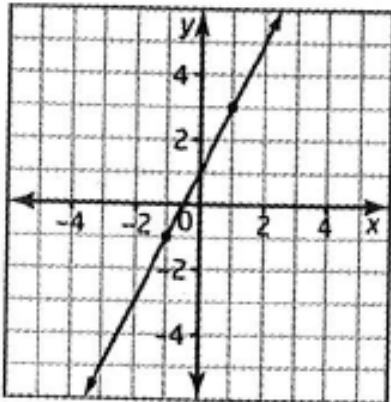Section 1: The Equation of a Line in Slope y-intercept Form: $y = mx + b$

1. Identify the slope and y-intercept of each line

	Equation	**Slope**	***y*-intercept**
a)	$y = 3x - 2$		
b)	$y = \dfrac{3}{4}x - 5$		
c)	$y = -\dfrac{2}{5}x$		
d)	$y = 5$		

2. Find the slope, *y*-intercept, and equation of each line in slope y-intercept form. (6 marks)
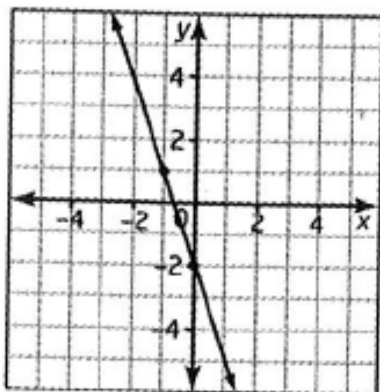
a)

Slope _____
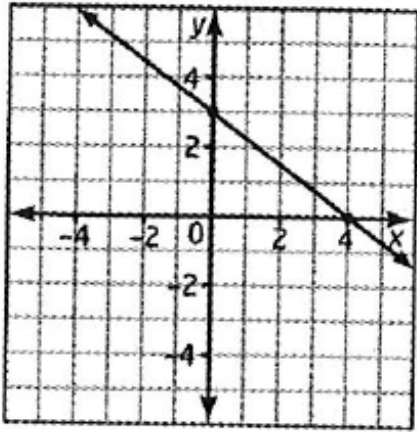
y-intercept _____

Equation: _____

b)

Slope _____

y-intercept _____

Equation: _____
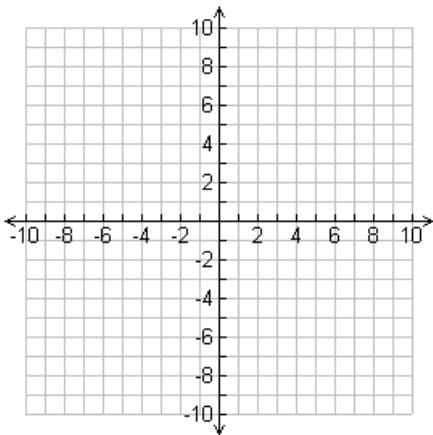
c)

Slope _____

y-intercept _____

Equation: _____

3. Identify the slope and y-intercept of each line, if they exist. Then graph the line.
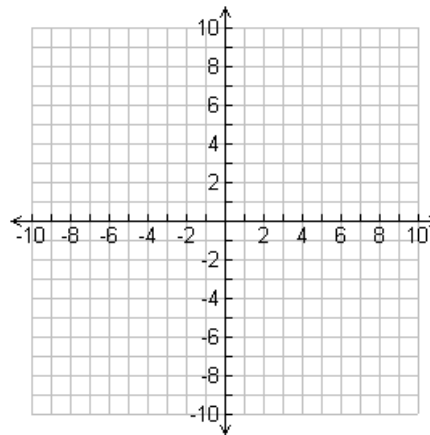
a) $y = 2$

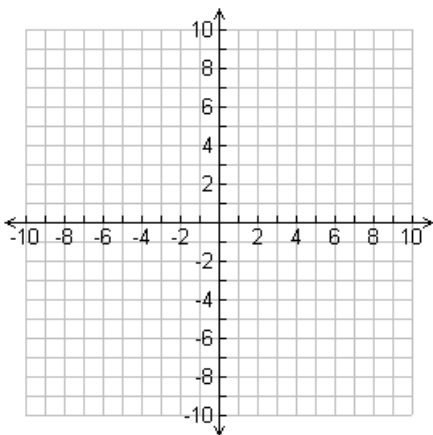slope:

y-intercept:

b) $x = 3$
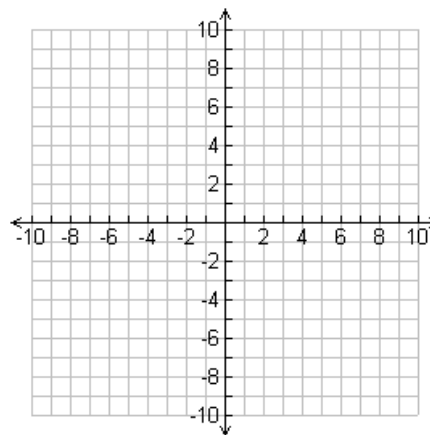
slope:

y-intercept:

c) $y = -4$

slope:

y-intercept:

d) $x = -1$

slope:

y-intercept:

Section 2: 6.2 The Equation of a Line in Standard Form

4. Express each equation in the form $y = mx + b$. Then state the slope and y-intercept.

a) $x + y - 4 = 0$

b) $x - y + 2 = 0$

c) $x + 4y + 3 = 0$

Slope: _____

y-intercept: _____

Slope: _____

y-intercept: _____

Slope: _____

y-intercept: _____

d) $x - 3y - 8 = 0$

e) $2x + 5y + 10 = 0$

f) $3x - 2y + 6 = 0$

Slope: _____

y-intercept: _____

Slope: _____

y-intercept: _____

Slope: _____

y-intercept: _____

5. The Gala Restaurant uses the equation $30n - C + 200 = 0$ to determine the cost for a room rental, where C represents the cost, in dollars, which depends on n, the number of people attending.

a) Express the equation in slope y-intercept form: $C = mn + b$

b) Identify the fixed (y-intercept) and variable costs (slope).

c) What is the rental cost if 100 people attend a hockey banquet?

6. The Home Medical Supplies Rental Company charges according to the equation $60m - C + 75 = 0$ to rent hospital beds, where C represents the cost, in dollars, which depends on m, the number of months that the bed is rented for.
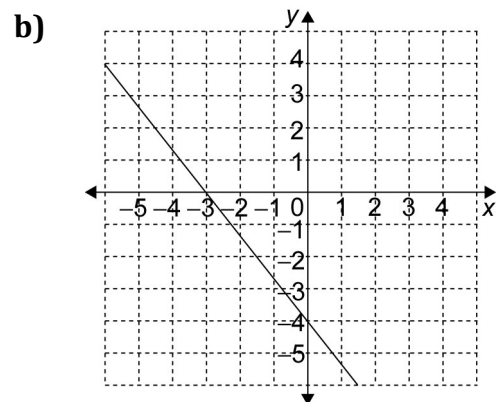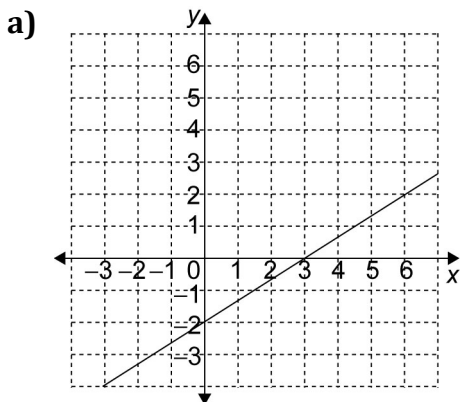
a) Express the equation in slope y-intercept form: $C = mn + b$

b) Identify the slope and y-intercept.

c) What is the rental cost if a hospital bed is rented for 5 months?

Section 3: Graph using x- and y-intercepts

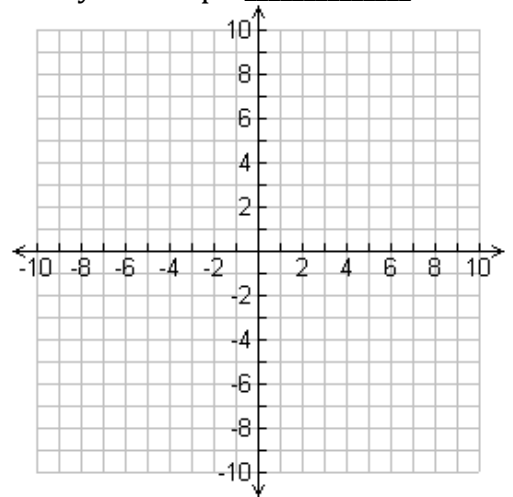7. Identify the x- and y-intercepts of each line

a)

b)

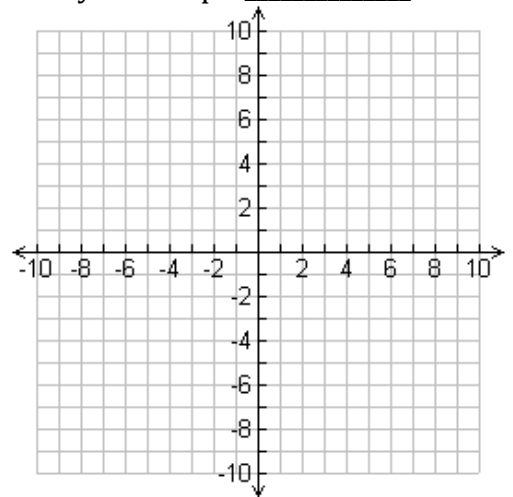8. Determine the x- and y-intercepts and use them to graph each line.

a) $3x + 4y = 12$

x-intercept: _____

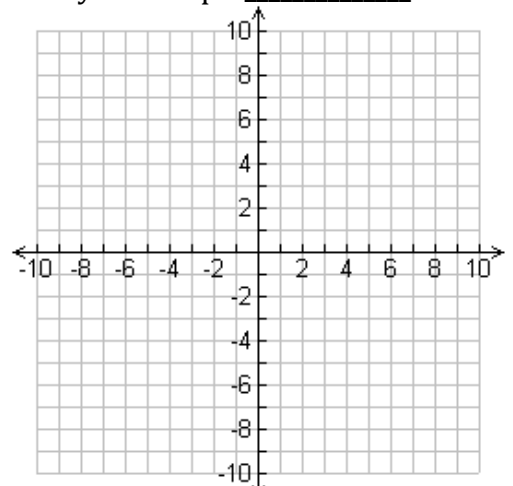y-intercept: _____

b) $2x + y = 8$

x-intercept: _____

y-intercept: _____

c) $x - 3y = 6$

x-intercept: _____

y-intercept: _____

d) $-2x + 3y = 6$

x-intercept: _____

y-intercept: _____

e) $3x = 9$

x-intercept: _____

y-intercept: _____
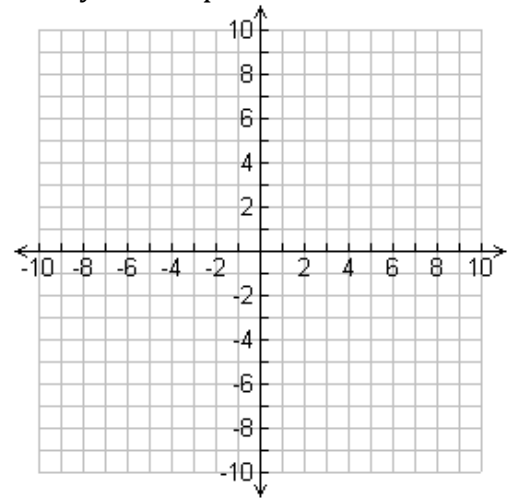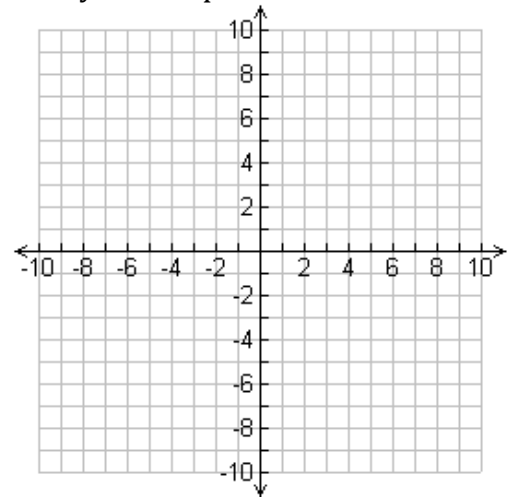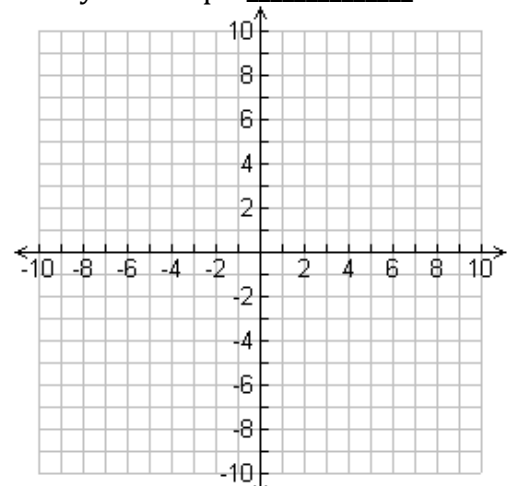

f) $4y = 8$

x-intercept: _____

y-intercept: _____

Section 4: Parallel and Perpendicular Lines

9. Find the slope of each pair of lines and state whether they are parallel, perpendicular or neither.

a) $y = 2x + 3$ and $y = 2x - 1$

b) $y = 4x + 2$ and $y = \frac{-1}{4}x + 1$

c) $y = 3x + 1$ and $y = \frac{1}{3}x + 1$

d) $y = \frac{1}{2}x + 1$ and $y = \frac{1}{2}x - 1$

e) $y = x + 1$ and $y = -x + 1$

f) $y = 3x - 2$ and $y = 2x - 3$

g) $y = 3$ and $y = -2$

h) $y = 1$ and $x = -1$

i) $x + y = 3$ and $x + y = 2$

j) $3x + 2y - 6 = 0$ and $2x - 3y + 6 = 0$

k) $2x + y - 1 = 0$ and $\frac{1}{2}x + y - 2 = 0$

l) $x + y - 2 = 0$ and $x - y - 2 = 0$

10. For each line, state the slope of a line that is parallel and a line that is perpendicular.

a) $y = 3x + 5$

b) $y = -2x + 3$

c) $y = \frac{2}{3}x + 4$

Parallel Slope:

Perpendicular Slope:

Parallel Slope:

Perpendicular Slope:

Parallel Slope:

Perpendicular Slope:

d) $y = -\frac{2}{5}x - 7$

e) $2x + 3y = 12$

f) $5x - 3y - 15 = 0$

Parallel Slope:

Perpendicular Slope:

Parallel Slope:

Perpendicular Slope:

Parallel Slope:

Perpendicular Slope:

g) $y = 3$

h) $x = 5$

i) $y = 7$

Parallel Slope:

Perpendicular Slope:

Parallel Slope:

Perpendicular Slope:

Parallel Slope:

Perpendicular Slope:

11. Determine whether or not the points A(1,3), B(5,1), and C(6,3) form a right angle triangle. Justify your answer with mathematical reasoning.

Section 5: Find an Equation for a Line Given the Slope and a Point

12. Find the equation of a line with the given slope and passing through the given point.

a) $m = 2, P(4,5)$

b) $m = -4, P(-3, -2)$

c) $m = \frac{3}{5}, P(5, -1)$

d) $m = -\frac{1}{4}, P(2,6)$

e) $m = 0, P(5, -4)$

f) $m = 3, P\left(\frac{2}{3}, \frac{1}{4}\right)$

g) $m = \frac{2}{3}, P(0,0)$

h) $m = \frac{1}{2}, P(-3, -4)$

i) $m = 5, P(2,3)$

13. Find the equation of a line…

a) parallel to $y = 2x + 5$, passing through $(3,2)$

b) perpendicular to $y = 3x - 4$, passing through (6, -3)

c) parallel to $y = 4$, passing through (2,3)

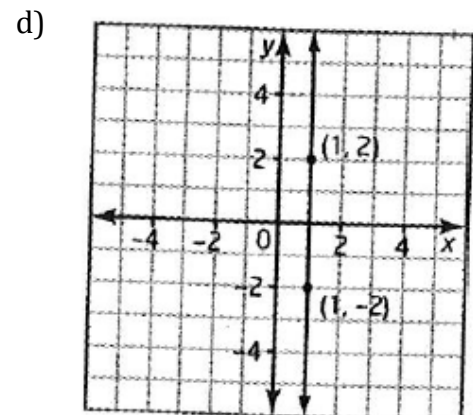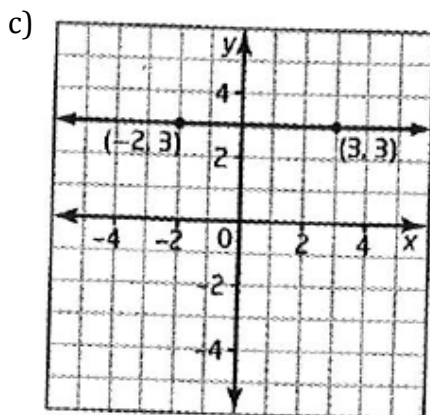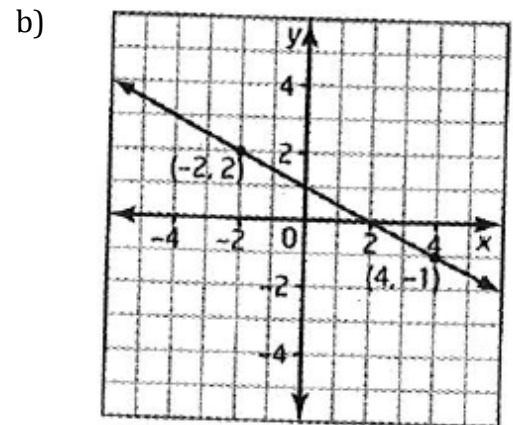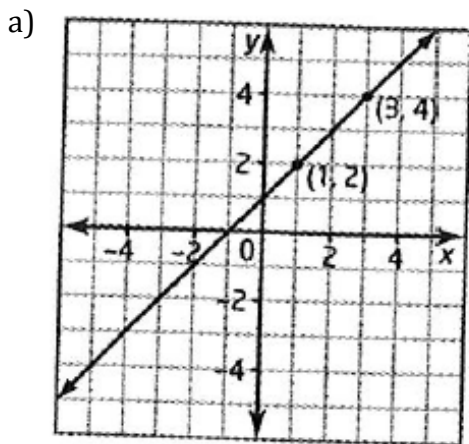d) parallel to $y = \frac{1}{2}x + 3$, passing through the origin

e) perpendicular to $y = -\frac{5}{2}x + 3$, passing through (5,-3)

f) with an x-intercept of 5 and a y-intercept of 15.

14. Find an equation for the line perpendicular to $2x + 5y - 3 = 0$, with the same y-intercept as $2x + 3y + 6 = 0$.

Section 6: Find an Equation for a Line Given Two Points

15. Find the equation of each line

a)

b)

c)

d)

16. Find an equation for the line passing through each pair of points.

a) A(3,4) and B(6,10)   b) D(1,5) and E(3,-3)
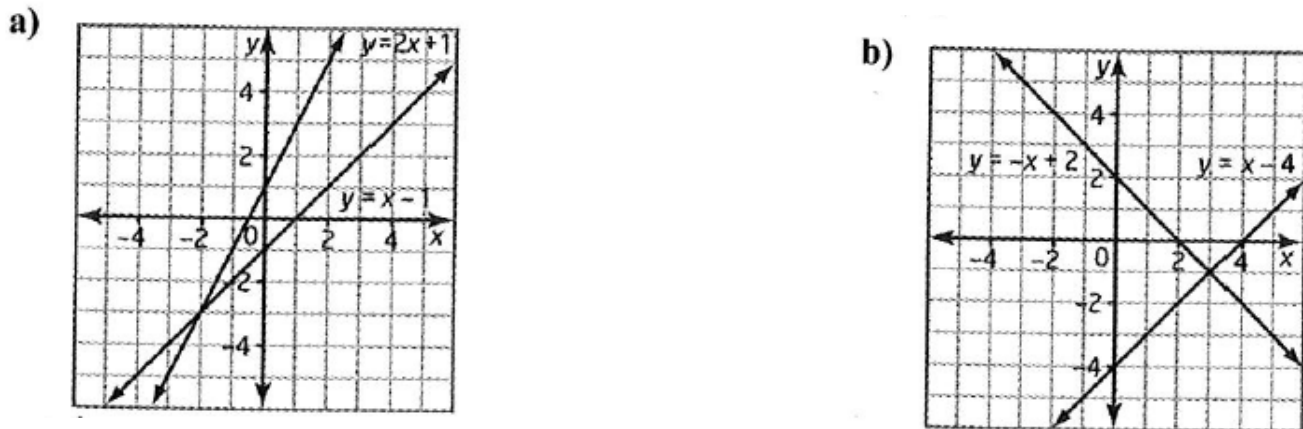
c) M(-3,6) and N(1,-4)   d) P(1,7) and Q(2,-3)

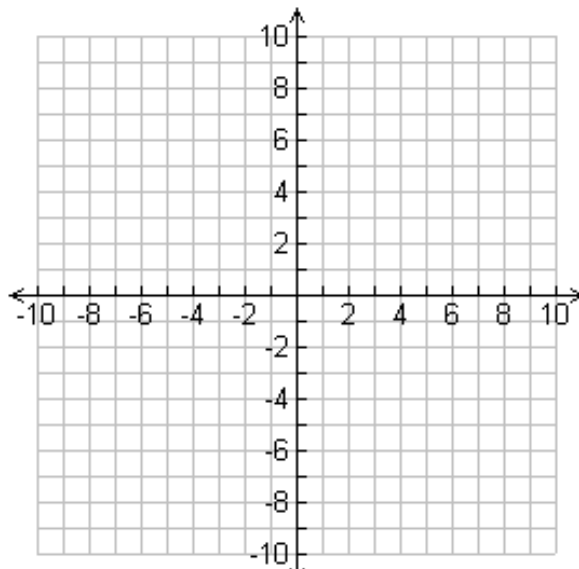e) x-intercept of -2 and y-intercept of 5   f) x-intercept of 4 and y-intercept of -2

Section 7: Linear Systems

17. Give the coordinates of the point of intersection of each linear system.
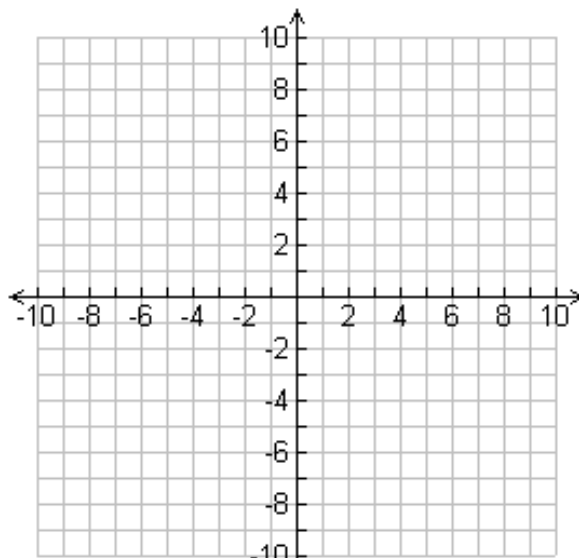
a)

b)

18. Solve each linear system by graphing each line and finding the point of intersection.
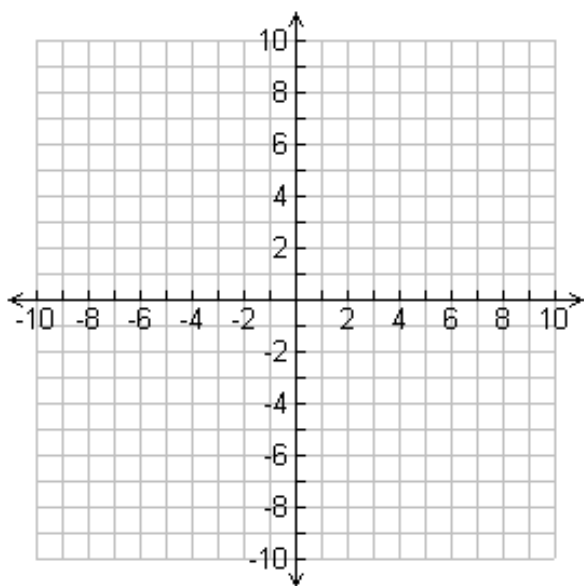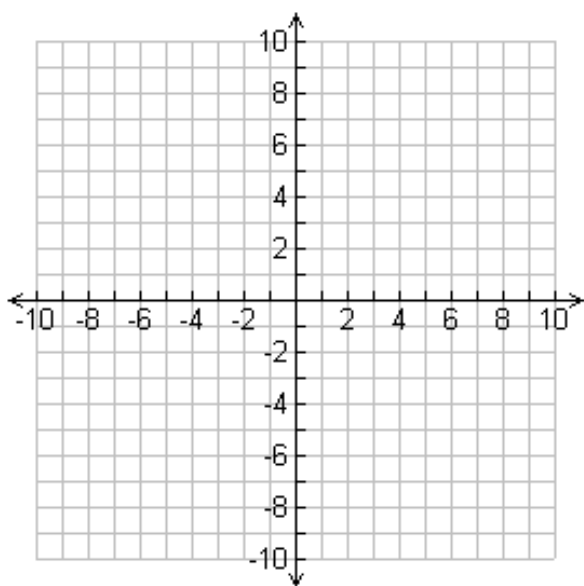
a) $y = x + 1$ and $y = 2x + 3$
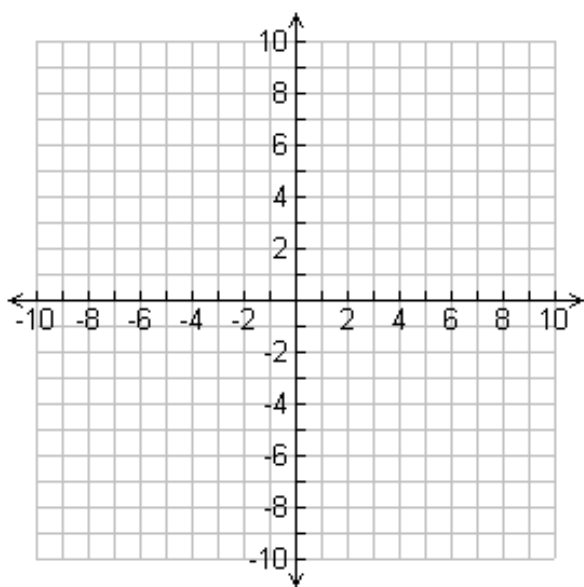

b) $x + y = 3$ and $x + 2y = 6$

c) $y = \frac{1}{2}x + 4$ and $2x + y + 6 = 0$

d) $y = 3x - 5$ and $3y - x = 9$
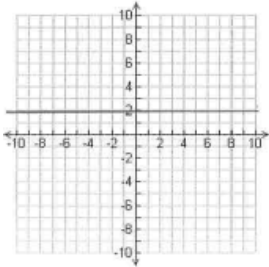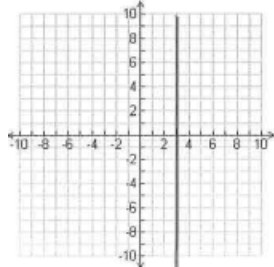

e) $3x - y = 4$ and $y = x - 6$

Answers:

1)a) 3; -2 b) ¾; -5 c) -2/5; 0 d) 0;5

2) 2; 1; y=2x+1 b) -3; -2; y=-3x-2 c) -3/4; 3; $y = \frac{-3}{4}x + 3$
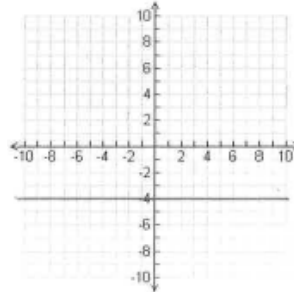
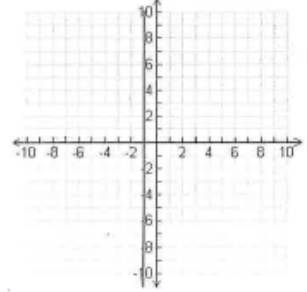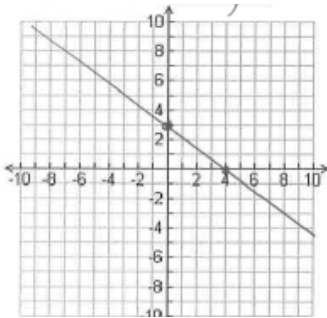3) a) 0; 2   b) undefined; none   c) 0;-4   d) undefined; none

4) a) y=-x+4; -1; 4 b) y=x+2; 1; 2 c) $y = \frac{-1}{4}x - \frac{3}{4}$; -1/4; -3/4 d) $y = \frac{1}{3}x - \frac{1}{8}$; $\frac{1}{3}$; $\frac{-8}{3}$

  e) $y = \frac{-2}{5}x - 2$; -2/5; -2 f) $y = \frac{3}{2}x + 3$; $\frac{3}{2}$; 3

5)a) $C = 30n + 200$ b) b=200, m=30 c) $3200
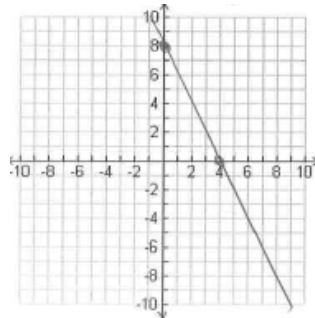
6) a) $C = 60m + 75$ b) m=60, b=75 c) $375

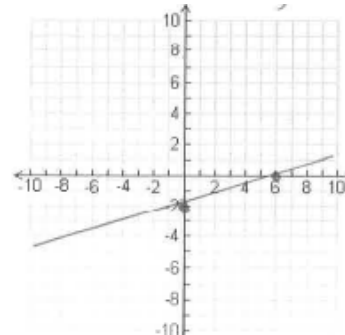7) a) (3,0) and (0,-2) b) (-3,0) and (0,-4)

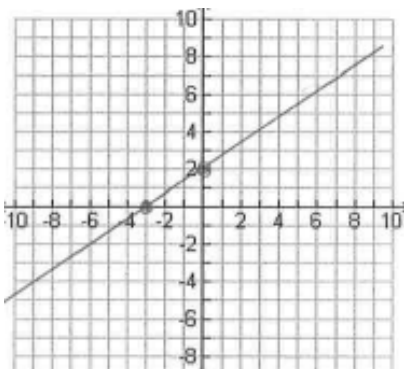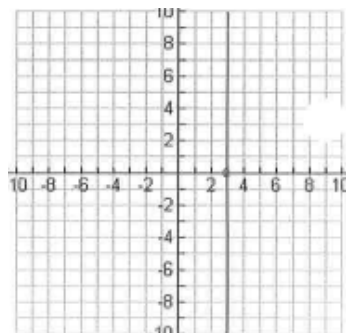8) a) (4,0) and (0,3)   b) (4,0) and (0,8)   c) (6,0) and (0,-2)
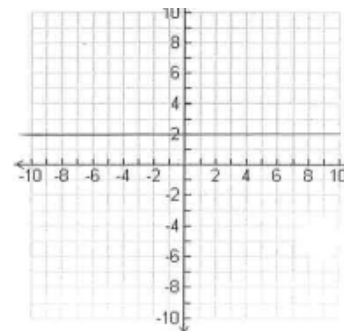

d) (-3,0) and (0,2)   e) (3,0) and none   f) none and (0,2)

9) a) parallel b) perpendicular c) neither d) parallel e) perpendicular f) neither g) parallel
 h) perpendicular i) parallel j) perpendicular k) neither   l) perpendicular

10) a) 3; -1/3 b) -2; ½ c) 2/3; -3/2 d) -2/5; 5/2 e) -2/3; 3/2 f) 5/3; -3/5 g) 0; undefined
h) undefined; 0 i) 0; undefined

11) Yes, AB is perpendicular to BC

12) a) y=2x-3 b) y=-4x-14 c) $y = \frac{3}{5}x - 4$ d) $y = -\frac{1}{4}x + \frac{13}{2}$ e) y=-4 f) $y = 3x - \frac{7}{4}$ g) $y = \frac{2}{3}x$
 h) $y = \frac{1}{2}x - \frac{5}{2}$ i) $y = 5x - 7$

13) a) y=2x-4 b) $y = \frac{-1}{3}x - 1$ c) y=3 d) $y = \frac{1}{2}x$ e) $y = \frac{2}{5}x - 5$ f) $y = -3x + 15$

14) $y = \frac{5}{2}x - 2$

15) a) y=x+1 b) $y = \frac{-1}{2}x + 1$ c) y=3 d) x=1

16) a) y=2x-2 b) y=-4x+9 c) $y = \frac{-5}{2}x - \frac{3}{2}$ d) y=-10x+17 e) $y = \frac{5}{2}x + 5$ f) $y = \frac{1}{2}x - 2$

17) a) (-2,-3) b) (3,-1)

18) a) (-2,-1)   b) (0,3) c) (-4,2) d) (3,4) e) (-1,-7)