

## 2.3 The Coordinate Plane

1)

- a)  $(-3, 1)$ : Quadrant II
- b)  $(-2, -4)$ : Quadrant III
- c)  $(3, 0)$ : Between Quadrants IV and I
- d)  $(2, 1)$ : Quadrant I
- e)  $(1, -3)$ : Quadrant IV

3)

- a) Any point  $(x, y)$  where  $x > 0$  and  $y > 0$  lies in Quadrant I.
- b) Any point  $(x, y)$  where  $x < 0$  and  $y > 0$  lies in Quadrant II.
- c) Any point  $(x, y)$  where  $x < 0$  and  $y < 0$  lies in Quadrant III.
- d) Any point  $(x, y)$  where  $x > 0$  and  $y < 0$  lies in Quadrants IV.
- e) Any point  $(x, y)$  where  $x < 0$  and  $y = 0$  lies between quadrants II and III.

5)

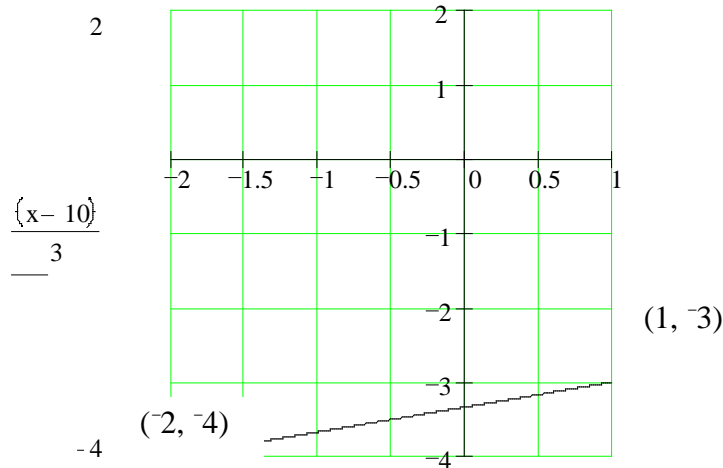
- a) Any point of the form  $(2, y)$  is acceptable, where  $y$  is any real number.
- b)  $x = 2$
- c) There are infinitely many points on avenue 2.

7)  $(-7, -1)$ .

9) To get from  $(2, -5)$  to  $(3, 4)$  we need a run of  $3 - 2 = 1$  and a rise of  $4 - (-5) = 4 + 5 = 9$ .

11)  $(1, -3)$  to  $(-2, -4)$

a)



b)

c) We can use the run and rise from part (b):

$$\text{DISTANCE} = \sqrt{(\text{RUN})^2 + (\text{RISE})^2}$$

$$d = \sqrt{(-3)^2 + (-1)^2}$$

$$d = \sqrt{9+1} = \sqrt{10} \quad 3.16$$

- 13) Circle has center  $(-1, 5)$  and contains the point  $(0, 2)$ . Its radius is simply the distance between these two points. The radius  $r$  is

$$r = \sqrt{[0 - (-1)]^2 + [2 - 5]^2}$$

$$r = \sqrt{(0+1)^2 + (-3)^2} = \sqrt{1^2 + 3^2}$$

$$r = \sqrt{1+9} = \sqrt{10} \quad 3.16$$

- 15) BASE of triangle =  $4 - ^-2 = 4 + ^+2 = 6$   
 HEIGHT of triangle =  $2 - ^-1 = 2 + ^+1 = 3$   
 Area of a triangle =  $\frac{1}{2}$  BASE HEIGHT  
 $A = \frac{1}{2} (6) (3) = 9$  square units (units<sup>2</sup>)

### Skill and Review

17)  $5\frac{1}{2} = 5 + \frac{1}{2} = \frac{10}{2} + \frac{1}{2} = \frac{10+1}{2} = \frac{11}{2}$

19)

a)  $^-48 \div ^-6 = ^+8 = 8$

b)  $7 \cdot ^-8 = ^-56$

c)  $^-105 \div 5 = ^-21$

d)  $^- \frac{3}{4} \cdot \frac{5}{3} = -\frac{15}{12} = -\frac{5}{4} = ^-1.25$