3.1 Coordinate system & 3.2 Functions

1. Use the midpoint and the distance formulas, respectively, to find (a) the midpoint and (b) the distance between the points (6, 5) and (–1, 4).

2. Given the points A = (–4, 3), B = (–5, 7), and C = (–1, 6), use the distance formula to find the lengths AB, BC, and CA, and determine whether the triangle ABC is (a) a right triangle, (b) an isosceles, (c) an equilateral triangle, or (d) neither.

3. Find (a) all possible intercepts, (b) all possible symmetries and graph the equation $y = \sqrt{4 - x^2}$.

4. Find (a) all possible intercepts, (b) all possible symmetries and graph the equation $x^2 - y^2 = 1$.

5. Determine whether the given equation determines y as a function of x. In case it does, write the function and find its domain.

(a) $2x - 3y = 2$

(b) $x - y^2 = 1$

(c) $y + 2x^2 = 6$

(d) $y = \sqrt{x - 2}$

(e) $y^3 - x = 0$

6. An object is thrown vertically up and its height (in feet) at time t (measured in seconds) is given by the formula

$$h(t) = -16t^2 + 256t .$$

(a) Find the height of the object at time 4 seconds.

(b) Find the time when the object hits the ground.

Answer key:

1. Midpoint (2.5,4.5), Distance $\sqrt{50} \approx 7.07$

2. isosceles   3. x-intercepts $(\pm 2, 0)$; y-intercept (0,2); symmetric with respect to y axis

4. x-intercept: $(\pm 1, 0)$, No y-intercept, symmetric about x axis, symmetric about y-axis, symmetric about origin

5. (a) Yes (b) No (c) Yes (d) Yes (e) Yes

6. (a) 768 ft (b) 16 sec