

## Problem Set 3

### Helpful Hints:

- Use graph paper. It will help you see some of the relationships you need to see.
  - You have the skills to do these problems. The challenge will be in understanding what skills to apply and whether you see the relationships.
1. Find the radius and coordinates of the center for a circle with diameter  $\overline{AB}$ ,  $A(2,0)$ ,  $B(5,4)$ . Draw a picture of the situation.
  2. Let  $A = (0,0)$ ,  $B = (7,1)$ ,  $C = (12, 6)$ , and  $D = (5,5)$ . Plot these points and connect the dots to form quadrilateral ABCD.
    - a. Verify that all four sides have the same length.
    - b. Suppose a segment is drawn from A to C. This segment is called a *diagonal*. Is triangle ABC a right triangle? Convince me that it is or is not a right triangle.
    - c. Suppose another segment is drawn from B to D, another diagonal. Is it the same length as the segment from A to C?
  3. Two different points on the line  $y = 2$  are exactly 13 units from the point  $(7,14)$ . Draw a picture of the situation, and then find the coordinates of these points.
  4. Give an example of a point that is the same distance from  $(3,0)$  as it is from  $(7,0)$ . Find lots of examples. Describe the configuration of all such points. In particular, how does this configuration relate to the two given points? Draw a picture of the situation.
  5. Verify that  $P = (1, -1)$  is the same distance from  $A = (5,1)$  as it is from  $B = (-1,3)$ . It is customary to say that P is equidistant from A and B. Find three more points that are equidistant from A and B. By the way “finding a point” means to find its coordinates. Can points equidistant from A and B be found in every quadrant?