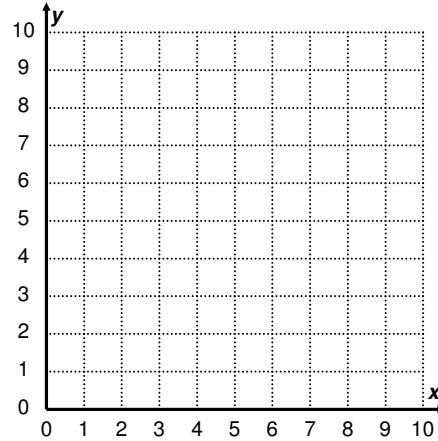# The Distance Formula: Classwork

Give irrational distances as exact (simplified) and approximate (nearest hundredth) lengths.

1. Use the grid on the right to answer the following. Remember that distances on a coordinate grid are measured in *units*.

    a. Find the distance between points A (1, 1) and B (9, 5). Show your algebra work.

Exact:
Approximate (hundredth):

    b. Find the distance between points C (0, 4) and D (3, 7). Show your algebra work.

Exact:
Approximate (hundredth):

    c. Find the distance between points E (4, 9) and F (10, 7). Show your algebra work.

Exact:
Approximate (hundredth):

2. Look back at your work from #1c.

    a. Subtract the x-coordinates from points E (4, 9) and F (10, 7).
    What does this number tell you about the right triangle that you drew on the grid?

    b. Subtract the y-coordinates from points E (4, 9) and F (10, 7).
    What does this number tell you about the right triangle that you drew on the grid?

    c. **Time to generalize!** Suppose you want to find the distance between points (x_1, y_1) and (x_2, y_2).
    Use the Pythagorean Theorem to relate the distance between the points and their coordinates.
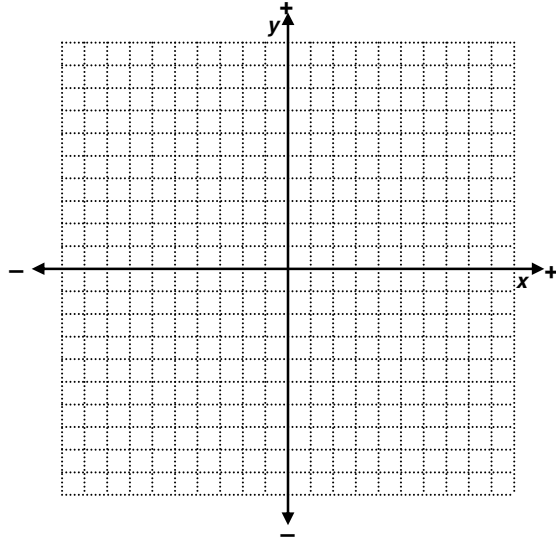
$$c^2 =$$

    Check your formula with a teacher before moving on!

3. Use the <u>formula</u> you found in #2 to find the distance between each pair of points. You may use the grid to check your work! Show your algebra work.
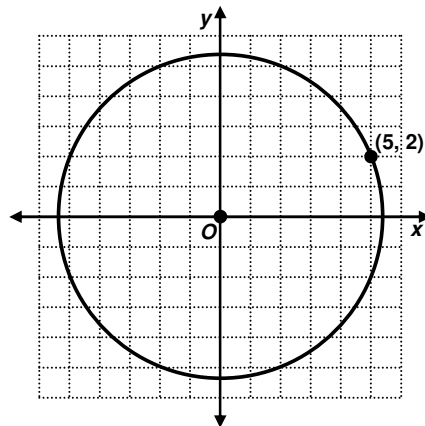
    a. G (8, 4) and H (4, –2)

    b. J (2, –8) and K (–8, –6)

4. Find the distance between points Q (50, 80) and R (130, 120). Show your work.

5. Find the distance between points S (–60, 110) and T (90, –150). Show your work.

6. The circle on the coordinate grid on the right has its center at the origin.

    a. Use the Pythagorean Theorem to find the radius of the circle (rounded to the nearest hundredth).

    b. Find the area of the circle (rounded to the nearest hundredth).

(5, 2)

O

7. A different circle has its center at the point (–4, –4). If the point (11, –6) is on the edge of the circle, what is the area of the circle (rounded to the nearest hundredth)? Show your work.

The Distance Formula: Homework

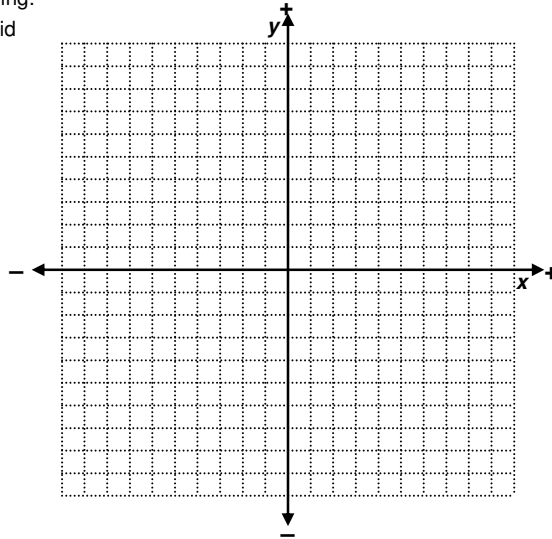**Give irrational distances as exact (simplified) and approximate (nearest hundredth) lengths.**

8. Use the grid on the right to answer the following. Remember that distances on a coordinate grid are measured in *units*.

   Show your work!

   a. *P* (5, –3) and *Q* (9, 6)

   b. *R* (–4, 9) and *S* (2, 3)

   c. *T* (2, 1) and *U* (–4, –7)

9. The circle on the coordinate grid on the right has its center at the origin.

   Use the Pythagorean Theorem to find the radius of the circle (rounded to the nearest hundredth).