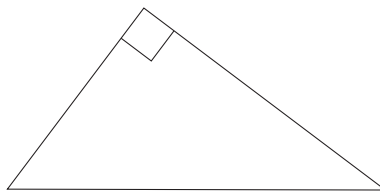1. What value of a makes the third point the same distance from the other two points?

   - $(-3, 2)$
   - $(3, 4)$
   - $(-3, a)$

2. The Pythagorean Theorem says that if a and b are the two legs of a right triangle and c is the length of the hypotenuse then
$$a^2 + b^2 = c^2.$$

   (a) Label the sides of the following triangle a, b and c to match the theorem.


   (b) Consider the two shorter sides of a right triangle. Suppose one of the sides measures 10 ft and the other 24 ft. How long is the hypotenuse.

   (c) Suppose that the hypotenuse of a right triangle has length 34 inches and one of the shorter sides has length 16 inches. What is the length of the third side?

   (d) Suppose the hypotenuse of a right triangle is 5/3 feet and the length of another side is 2 feet. How long is the third leg? What does your answer say about the described triangle?

3. A bow used for archery has a string that is 58 inches long. When the middle of the string is drawn back to fire an arrow the tips of the bow flex and become 16 inches closer to one another. Find the distance indicated with a question mark in the figure.
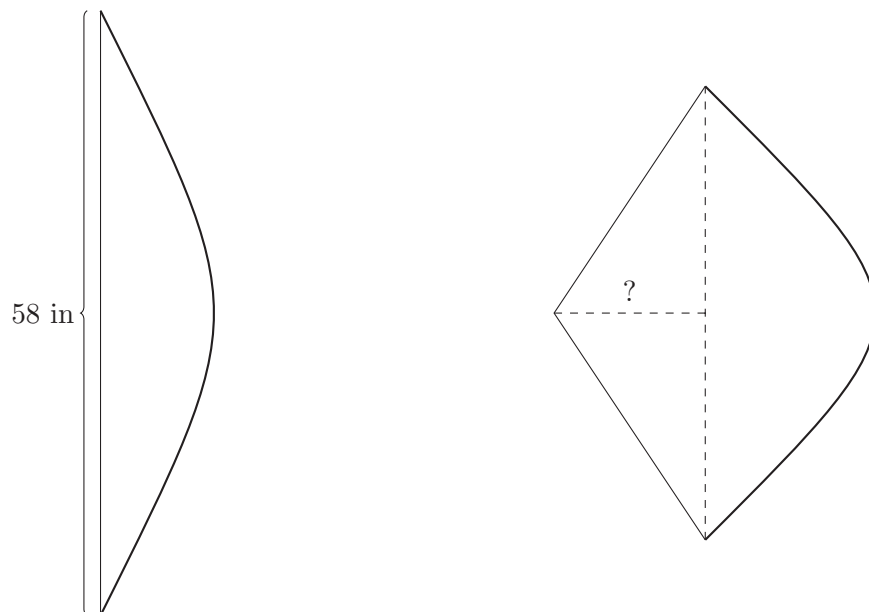
4. Find the distance between the two points

   (a) $(0,0)$ and $(3,0)$
   (b) $(0,0)$ and $(-3,0)$
   (c) $(2,4)$ and $(5,4)$
   (d) $(1/2,2)$ and $(7/4,2)$

   (e) $(2,4)$ and $(2,28)$
   (f) $(-1,-2)$ and $(-1,5)$
   (g) $(1,-2/3)$ and $(1,5/3)$
   (h) $(0,0)$ and $(5/a,0)$

5. Draw the distance between the two points as the hypotenuse of a right triangle, then find the distance. If your answer is not a perfect square, leave it expressed as a radical

   (a) $(0,0)$ and $(-3,4)$
   (b) $(0,0)$ and $(3/2,-2)$
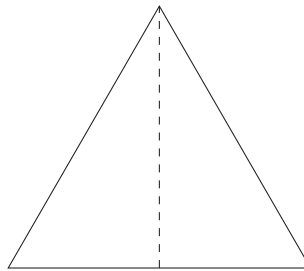   (c) $(2,-3)$ and $(5,9)$

   (d) $(1,2)$ and $(7,-1)$
   (e) $(2,4)$ and $(9,28)$
   (f) $(0,0)$ and $(5/a,12/a)$

6. Which points on the line $x = 11$ are 10 units away from $(3,0)$?

7. Which points in the plane are 3 units from the point $(-1,-4)$ and have their second coordinate equal to their first coordinate?

8. Consider an equilateral triangle with sides of length 1

   (a) If we fold along the dotted line we get a right triangle, what are the side lengths of the right triangle?
   (b) What is the area of the right triangle?
   (c) What is the perimeter of the right triangle?
   (d) What is the area of the original triangle?