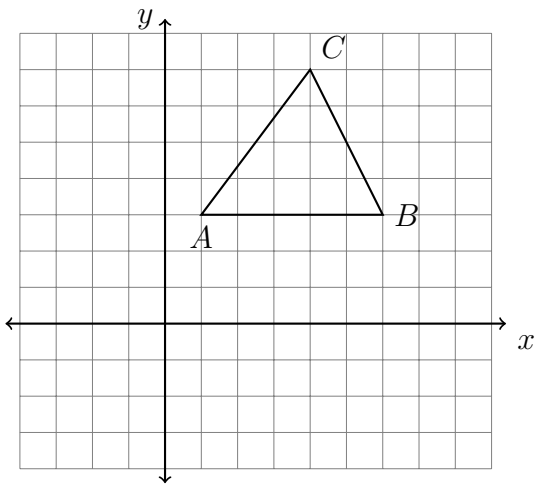
13.7 Homework: Cross sections, distance applications

1. In the diagram below, $\triangle ABC$ has vertices with coordinates $A(1,3)$, $B(6,3)$ and $C(4,7)$.

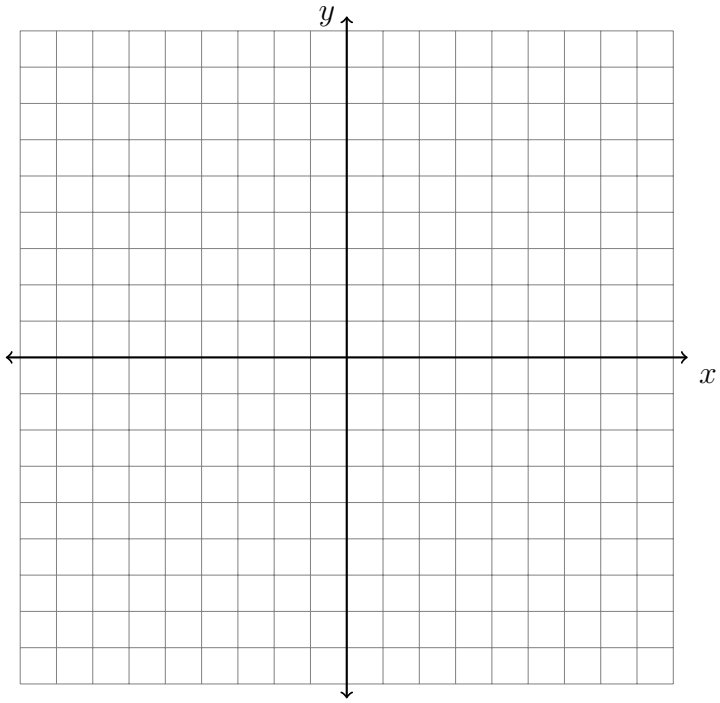


Find the length of each side of $\triangle ABC$, showing that it is isosceles and not equilateral.

$AC =$	$BC =$	$AB =$
$\sqrt{(x_C - x_A)^2 + (y_C - y_A)^2}$	$\sqrt{(x_C - x_B)^2 + (y_C - y_B)^2}$	$\sqrt{(x_B - x_A)^2 + (y_B - y_A)^2}$

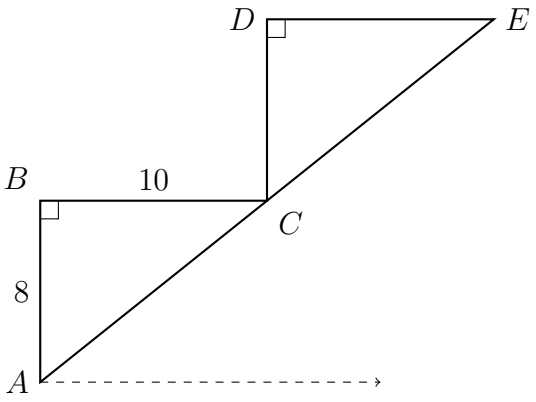
2. Find the length of the line segment $A(1,3)$ $B(3,7)$. Simplify the radical.

3. On the set of axes below, graph the quadrilateral $ABCD$ having coordinates $A(-3, -3)$, $B(5, 1)$, $C(6, 8)$, and $D(-2, 4)$.

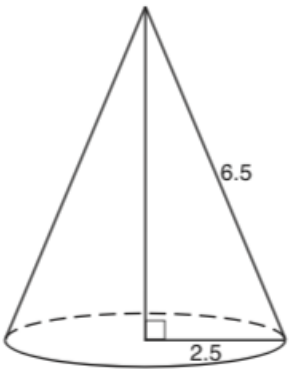


Find the length of each side of the quadrilateral.

4. A staircase riser is cut as a series of congruent triangles with each step's "rise" equal to 8 inches, and the "run" of each step is 10 inches, as shown below. ($AB = 8$ and $BC = 10$) Find the diagonal length of the two-step riser, the distance AE, to the *nearest inch*.



5. As shown in the diagram below, the radius of a cone is 2.5 cm and its slant height is 6.5 cm.



   (a) Find the height of the cone.

   (b) How many cubic centimeters are in the volume of the cone? Express your answer in terms of π.

6. Which three-dimensional figure will result when a rectangle 6 inches long and 5 inches wide is continuously rotated about the longer side?

   (a) a rectangular prism with a length of 6 inches, width of 6 inches, and height of 5 inches

   (b) a rectangular prism with a length of 6 inches, width of 5 inches, and height of 5 inches

   (c) a cylinder with a radius of 5 inches and a height of 6 inches

   (d) a cylinder with a radius of 6 inches and a height of 5 inches

7. An isosceles right triangle whose legs measure 6 is continuously rotated about one of its legs to form a three-dimensional object. The three-dimensional object is a

   (a) cylinder with a diameter of 6

   (b) cylinder with a diameter of 12

   (c) cone with a diameter of 6

   (d) cone with a diameter of 12

8. A right cylinder is cut perpendicular to its base. The shape of the cross section is a

   (a) circle

   (b) cylinder

   (c) rectangle

   (d) triangular prism

9. Simplify each expression. (Leave it in radical form if necessary, not a decimal.)

   (a) $\sqrt{121}$

   (b) $\sqrt{48}$

   (c) $\sqrt{27}$

   (d) $\sqrt{8}$