

## Indicators

### Objective:

**3.02 Apply geometric properties and relationships, including the Pythagorean Theorem, to solve problems.**

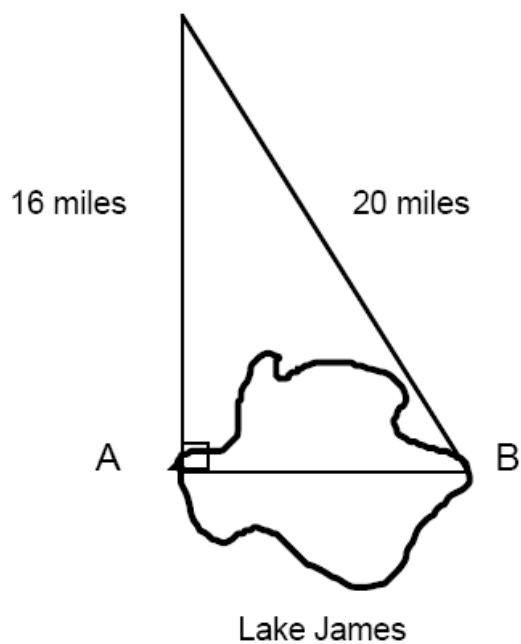
Vocabulary and Resources		
right triangle	complementary angles	square
hypotenuse	supplementary angles	square root
leg	perimeter	irrational number
Pythagorean triple	area	

**A.** Mr. Adams has enclosed a square flower bed in his yard that measures 5 feet on a side. He decides to partition the square into two triangular parts by placing a row of bricks, each 1 foot long, diagonally through the square. How many bricks will he need?

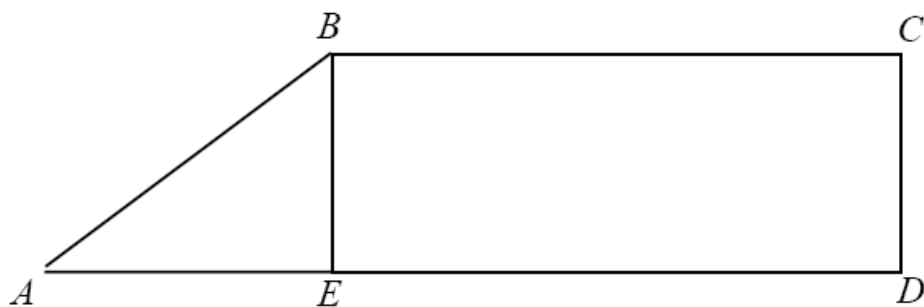
**B.** A television tower has a guy wire attached 6 meters from the top of the tower and secured to the ground 40 feet from the base of the tower. If the guy wire is 50 meters in length, how tall is the tower?

**C.** Josh marked off a section of the playground in the shape of a right triangle. If the hypotenuse of the triangular section measures 10 meters and one of the legs measures 6 meters, what is the area of this section of the playground?

**D.** Use the diagram below to determine the distance across Lake James.



**E.** The perimeter of rectangle  $BCDE$  is 32 inches. If the length of the rectangle is 3 times its width and the area of triangle  $ABE$  is 6 square inches, what is the perimeter of trapezoid  $ABCD$ ?



(From SREB publication *Getting Students Ready for Algebra I: What Middle Grades Students Need to Know and Be Able to Do*)

**F.** Two students are using a measuring tape to find the length of a room. The tape reads 13 feet  $6\frac{1}{4}$  inches; however, the student at one end is holding the tape 9 inches higher than the student at the other end. What is the difference between their measurement and the true length?

**G.** Figure  $ABCDE$  is a convex polygon with such that:

$$m\angle A = 6x^\circ,$$

$$m\angle B = (4x + 13)^\circ,$$

$$m\angle C = (x + 9)^\circ,$$

$$m\angle D = (2x - 8)^\circ, \text{ and}$$

$$m\angle E = (4x - 1)^\circ.$$

What are the degree measures of each of the angles?

**H.** Triangle  $ABC$  is similar to triangle  $DEF$ . If the lengths of the sides of the two triangles are in the ratio of 2:1, what is the ratio of the area of the larger triangle to the area of the smaller triangle?

**I.** A cereal box has the following dimensions: 27 cm x 18 cm x 6 cm. To become more environmentally friendly, a company is trying to decide if it should change the shape of the cereal box to a cylinder with a height of 27 cm and a diameter of 18 cm. Would it hold the same amount of cereal? Why or why not?

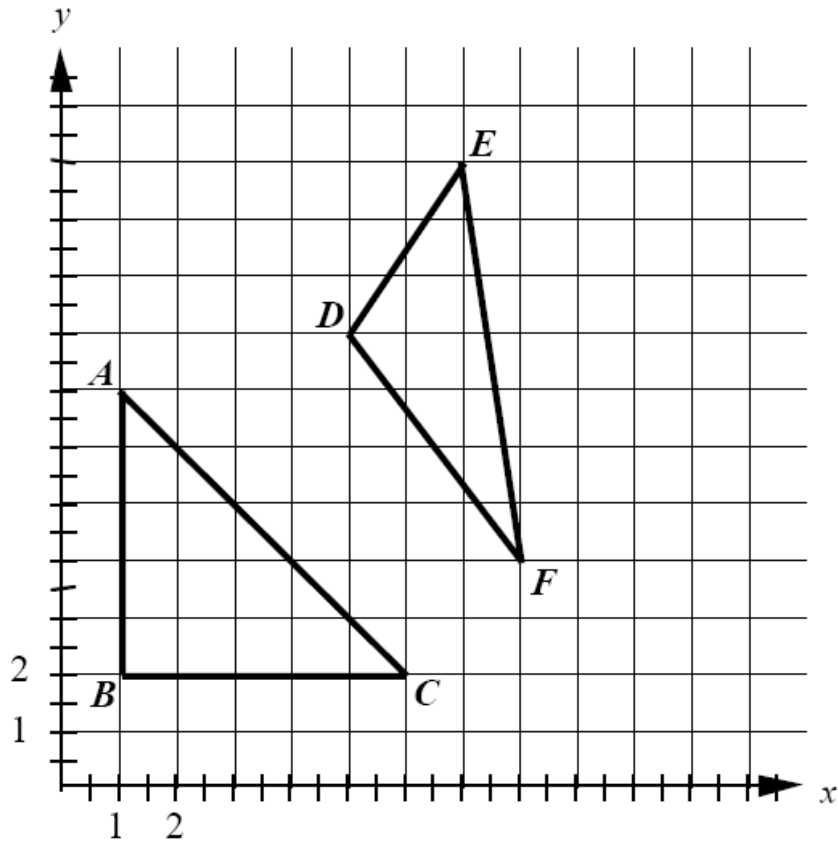
**J.** Give the exact length of side  $AC$  for triangle  $ABC$ .

a) 50

b) 25

c)  $5\sqrt{2}$

d)  $\sqrt{10}$



**K.** Determine the perimeter of triangle  $DEF$ . Give your answer to the nearest tenth of a unit.

**L.** Complete the following chart of Pythagorean triples (three positive integers that satisfy the condition that  $a^2 + b^2 = c^2$ ).

<i>a</i>	<i>b</i>	<i>c</i>
<b>3</b>		<b>5</b>
	<b>12</b>	<b>13</b>
<b>7</b>		<b>25</b>
<b>8</b>	<b>15</b>	
<b>21</b>		<b>29</b>

**M.** Using the fact that 3, 4, 5 is a Pythagorean triple, which of the following are also Pythagorean triples?

- (5, 6, 7)
- (6, 8, 10)
- (12, 16, 20)
- (30, 40, 50)
- (35, 45, 55)