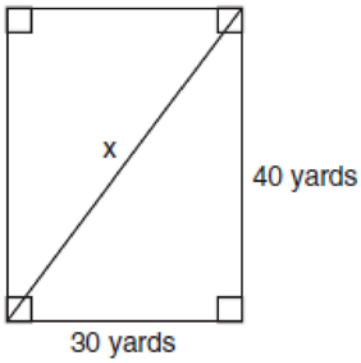
A.A.45: Pythagorean Theorem 2: Determine the measure of a third side of a right triangle using the Pythagorean theorem, given the lengths of any two sides

1 The lengths of the sides of a right triangle can be
1) $9, 12, 15$
2) $8, 10, 13$
3) $5, 5, 10$
4) $4, 5, 6$

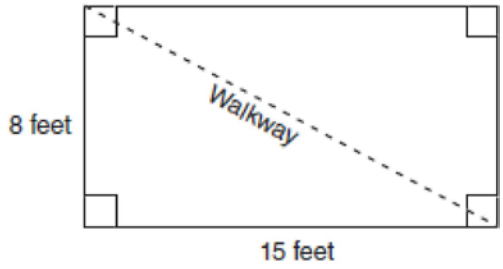
2 Which set of numbers represents the lengths of the sides of a right triangle?
1) $\{7, 24, 25\}$
2) $\{9, 16, 23\}$
3) $\{10, 12, 14\}$
4) {14, 16, 18

3 Tanya runs diagonally across a rectangular field that has a length of 40 yards and a width of 30 yards, as shown in the diagram below.



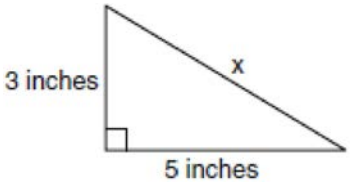
What is the length of the diagonal, in yards, that Tanya runs?

4 Nancy's rectangular garden is represented in the diagram below.

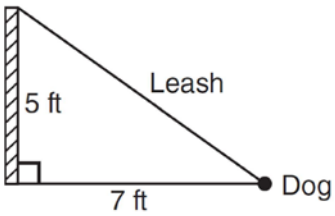


If a diagonal walkway crosses her garden, what is its length, in feet?

5 What is the value of x, in inches, in the right triangle below?



6 The end of a dog's leash is attached to the top of a 5-foot-tall fence post, as shown in the diagram below. The dog is 7 feet away from the base of the fence post.



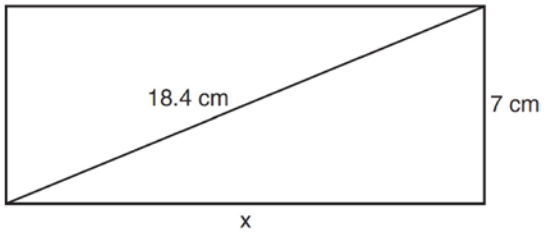
How long is the leash, to the *nearest tenth of a foot*?

7 The legs of an isosceles right triangle each measure 10 inches. What is the length of the hypotenuse of this triangle, to the *nearest tenth of an inch*?

8 The length of one side of a square is 13 feet. What is the length, to the *nearest foot*, of a diagonal of the square?

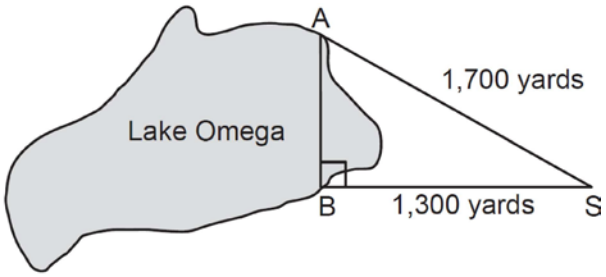
9 The length and width of a rectangle are 48 inches and 40 inches. To the *nearest inch*, what is the length of its diagonal?

10 The rectangle shown below has a diagonal of 18.4 cm and a width of 7 cm.



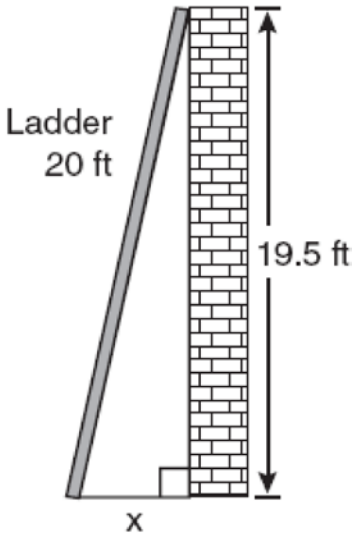
To the *nearest centimeter*, what is the length, x, of the rectangle?

11 Campsite A and campsite B are located directly opposite each other on the shores of Lake Omega, as shown in the diagram below. The two campsites form a right triangle with Sam's position, S. The distance from campsite B to Sam's position is 1,300 yards, and campsite A is 1,700 yards from his position.



What is the distance from campsite A to campsite B, to the *nearest yard*?

12 Don placed a ladder against the side of his house as shown in the diagram below.



Which equation could be used to find the distance, x, from the foot of the ladder to the base of the house?

13 The length of the hypotenuse of a right triangle is 34 inches and the length of one of its legs is 16 inches. What is the length, in inches, of the other leg of this right triangle?

14 In triangle RST, angle R is a right angle. If $TR = 6$ and $TS = 8$, what is the length of $\overline{RS}$?

15 In right triangle ABC, $m\angle C = 90$, $AC = 7$, and $AB = 13$. What is the length of $\overline{BC}$?

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Answer Section

1 ANS: 1 REF: 061415ia

2 ANS: 1

$7^2 + 24^2 = 25^2$

REF: 011526ia

3 ANS:

50

$30^2 + 40^2 = c^2$. 30, 40, 50 is a multiple of 3, 4, 5.

$$2500 = c^2$$
$$50 = c$$

REF: fall0711ia

4 ANS:

17

$8^2 + 15^2 = c^2$

$$c^2 = 289$$
$$c = 17$$

REF: 080906ia

5 ANS:

$\sqrt{34}$

$3^2 + 5^2 = x^2$

$$34 = x^2$$
$$\sqrt{34} = x$$

REF: 060909ia

6 ANS:

8.6

$\sqrt{5^2 + 7^2} \approx 8.6$

REF: 081004ia

7 ANS:

14.1

$10^2 + 10^2 = c^2$

$$c^2 = 200$$
$$c \approx 14.1$$

REF: 061102ia

8 ANS:
18

$13^2 + 13^2 = x^2$

$338 = x^2$

$\sqrt{338} = x$

$18 \approx x$

REF: 061223ia

9 ANS:
62

$\sqrt{48^2 + 40^2} = \sqrt{2304 + 1600} = \sqrt{3904} \approx 62$

REF: 011417ia

10 ANS:
17

$\sqrt{18.4^2 - 7^2} \approx 17$

REF: 011107ia

11 ANS:
1,095

$\sqrt{1700^2 - 1300^2} \approx 1095$

REF: 011221ia

12 ANS:

$x = \sqrt{20^2 - 19.5^2}$

REF: 060825ia

13 ANS:
30

$16^2 + b^2 = 34^2$

$b^2 = 900$

$b = 30$

REF: 080809ia

14 ANS:
$2\sqrt{7}$

$\sqrt{8^2 - 6^2} = \sqrt{28} = \sqrt{4}\sqrt{7} = 2\sqrt{7}$

REF: 061329ia

15 ANS:

$\sqrt{120}$

$\sqrt{13^2 - 7^2} = \sqrt{120}$

REF: 081323ia