Pythagorean theorem word problems

Sketch the right triangle, call the side you are finding x, then use $a^2 + b^2 = c^2$.

Name _____ Date _____

1. A hiker walks 20 km east, then 15 km north. How far is the hiker from the starting point, in a straight line?

   x = _____

2. A 30 ft ladder leans against a wall, with its foot 18 ft from the wall. How high up the wall does the ladder reach?

   x = _____

3. A wire runs from the top of a 12 ft pole to a stake in the ground 5 ft from the foot of the pole. How long is the wire?

   x = _____

4. A 26 ft ladder leans against a wall, with its foot 10 ft from the wall. How high up the wall does the ladder reach?

   x = _____

5. A rectangular garden is 8 m long and 6 m wide. How long is a straight path across it from one corner to the opposite corner?

   x = _____

6. A hiker walks 16 km east, then 12 km north. How far is the hiker from the starting point, in a straight line?

   x = _____

7. A kite flies on a tight string 30 m long. The kite is 18 m across from the hand holding the string, measured level with the hand. How high is the kite above the hand?

   x = _____

8. A rectangular garden is 24 m long and 10 m wide. How long is a straight path across it from one corner to the opposite corner?

   x = _____

Pythagorean theorem word problems: answer key

Each answer in colour, with the working before it.

1. $20^2 + 15^2 = x^2$
   $400 + 225 = 625$
   $x = \sqrt{625} =$ **25 km**

2. $x^2 + 18^2 = 30^2$
   $x^2 = 900 - 324 = 576$
   $x = \sqrt{576} =$ **24 ft**

3. $5^2 + 12^2 = x^2$
   $25 + 144 = 169$
   $x = \sqrt{169} =$ **13 ft**

4. $x^2 + 10^2 = 26^2$
   $x^2 = 676 - 100 = 576$
   $x = \sqrt{576} =$ **24 ft**

5. $6^2 + 8^2 = x^2$
   $36 + 64 = 100$
   $x = \sqrt{100} =$ **10 m**

6. $16^2 + 12^2 = x^2$
   $256 + 144 = 400$
   $x = \sqrt{400} =$ **20 km**

7. $x^2 + 18^2 = 30^2$
   $x^2 = 900 - 324 = 576$
   $x = \sqrt{576} =$ **24 m**

8. $10^2 + 24^2 = x^2$
   $100 + 576 = 676$
   $x = \sqrt{676} =$ **26 m**