Extracting a Triangle from a Picture Practice

1. A swinging gate has outside dimensions of
   30 inches by 38 inches. What is the length
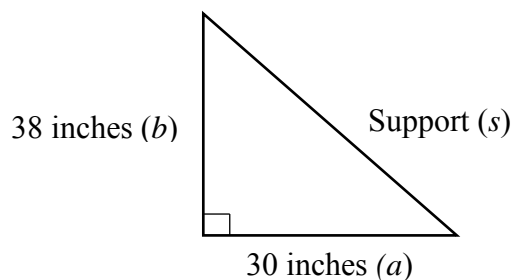   of the diagonal support, to the nearest inch?

Step 1: Identify the given and the required values.
- *The length of the gate is 30 inches.*
- *The width of the gate is 38 inches.*
- *The length of the diagonal support is the unknown.*

Step 2: Draw and label the diagram.

38 inches (*b*)   Support (*s*)

30 inches *(a)*

Steps 3 and 4: Write the formula, substitute known values, and solve.

$$a^2 + b^2 = s^2$$
$$30^2 + 38^2 = s^2$$
$$900 + 1444^2 = s^2$$
$$2344 = s^2$$
$$48.41 = s$$

The length of the diagonal support is approximately 48 inches.

Step 5: Review the answer.
The diagonal support is the hypotenuse, which is the longest side of the triangle. As such, the answer is reasonable.

2. A Blackfoot nation is planning a Pow
    Wow. A tipi, for the central gathering
    place, needs to have a radius of 18.5 feet
    and a height of 22.25 feet (in the centre).

    A rawhide tarp makes up the wall of the
    tipi. From the ground to the top of the tipi,
    what is the length of the rawhide wall, to
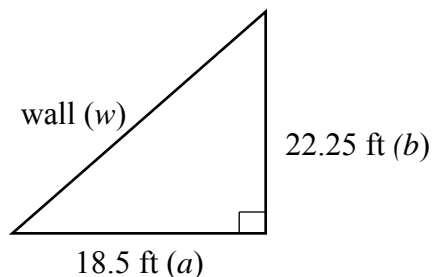   the nearest hundredth of a foot?

© Thinkstock

Step 1: Identify the given and the required values.
- *The height of the tipi is 22.25 feet.*
- *The radius of the tipi is 18.5 feet.*
- *The length of the rawhide wall is the unknown.*

Step 2: Draw and label the diagram.

wall (*w*)
22.25 ft (*b*)
18.5 ft (*a*)

Steps 3 and 4: Write the formula, substitute known values, and solve.

$$a^2 + b^2 = w^2$$
$$18.5^2 + 22.25^2 = w^2$$
$$342.25 + 495.0625^2 = w^2$$
$$837.3125 = w^2$$
$$28.94 = w$$

The wall of the tipi is approximately 28.94 feet.

Step 5: Review the answer.
*The wall of the tipi is the hypotenuse, which is the longest side of the
triangle. As such, the answer is reasonable.*