MATC9 Ch 2.1 Key Concepts 3 Pythagorean Theorem Worked Example

Example 1: Use the
Pythagorean theorem to find
the unknown side of the
triangle shown.

Solution: Since the
hypotenuse is the unknown
side, use the formula
$c^2 = a^2 + b^2$ and substitute
for a and b.

$c^2 = 11.2^2 + 6.1^2$
$\quad = 162.65$
$c = \sqrt{162.65}$
$\quad = 12.8 \text{ m}$

The hypotenuse measures 12.8 m.

Example 2: Use the Pythagorean
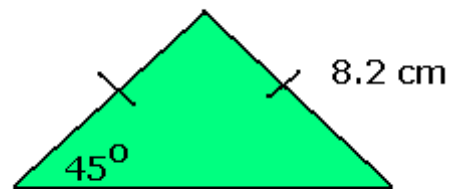theorem to find the unknown side of
the triangle shown.

Solution: Since one of the shorter
sides is the unknown side, use the
formula $c^2 = a^2 + b^2$ and substitute
for c and a.

$24.2^2 = 19.8^2 + b^2$
$\quad b^2 = 24.2^2 - 19.8^2$
$\qquad = 193.6$
$\quad b = \sqrt{193.6}$
$\qquad = 13.9 \text{ cm}$

The side measures 13.9 cm.

Practice:

1. Use the Pythagorean theorem to find the
hypotenuse of the triangle shown.

2. A radio transmitting antenna casts a shadow 16.4 m long. A guy wire 22.8 m long
runs from the end of the shadow to the top of the antenna. Use the Pythagorean
theorem to find the height of the antenna.

Answers: 1. 11.6 cm   2. 15.8 m