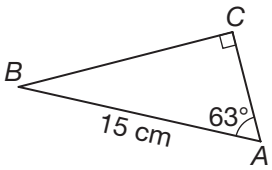
Mid-Chapter Review

1. Calculate each side length in ΔABC, to one decimal place.



a) side BC

$\sin 63° = \frac{BC}{15}$

$15 \times \sin 63° = BC$

$13.3650... = BC$

$BC \doteq 13.4$ cm

b) side AC

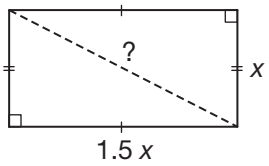
$AC^2 + 13.4^2 = 15^2$

$AC^2 = 15^2 - 13.4^2$

$AC = \sqrt{225 - 179.56}$

$AC = 6.740...$, or about 6.7 cm

2. The length of a rectangular box must be 1.5 times its width.



a) What two other sets of dimensions are possible?

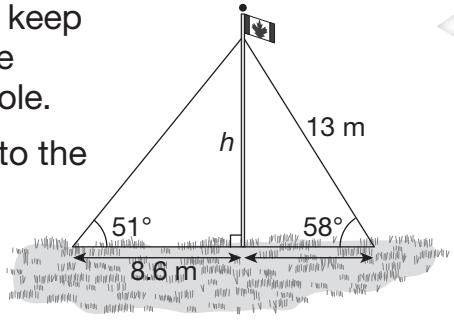
6 ft by 4 ft, or e.g., 12 ft by 8 ft or 4.5 m by 3 m

b) Samuel is putting a divider on the diagonal to make two spaces in a 6 ft by 4 ft box. He said the diagonal should be $7\frac{1}{2}$ ft long. Will this fit? Explain.

No, it's too long. $6^2 + 4^2 = 36 + 16$, or 52

$c^2 = 52$, so $c = \sqrt{52}$, or 7.211... The diagonal is 7.2 ft long.

3. Two guy wires, of unequal lengths, keep this flagpole vertical. Both wires are attached 3 m from the top of the pole.



Hint

For Part a), use the triangle at the right.

a) What is the height of the pole, to the nearest metre?

$\sin 58° = \frac{h}{13}$

$13 \times \sin 58° = h$

$11.0246... = h$ The height is about $11 + 3 = 14$ m.

b) The other wire is attached on the ground, 8.6 m from the pole. What is the length of this wire? (Show two solutions.)

e.g., $c^2 = 11^2 + 8.6^2$

$c = \sqrt{121 + 73.96}$

$c = \sqrt{194.96}$, or 13.9628...

e.g., $\sin 51° = \frac{11}{a}$

$a \times \sin 51° = 11$

$a = \frac{11}{\sin 51°}$

$a = 14.1543...$

The wire is about 14 m long.