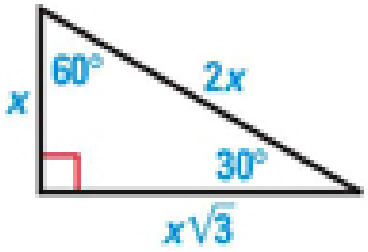
Special Right Triangle Notes

A. All of these ratios are derived from the Pythagorean Theorem.

B. $30° - 60° - 90°$ Triangles



#1 Given the shorter side is 10 cm, what are the longer side and the hypotenuse?

$$shorter\ side = x = 10\ cm$$
$$longer\ side = x\sqrt{3} = 10\sqrt{3}\ cm$$
$$hypotenuse = 2x = 2(10) = 20\ cm$$

#2 Given the longer side is 8 in, what are the shorter side and the hypotenuse?

Solve the equation.

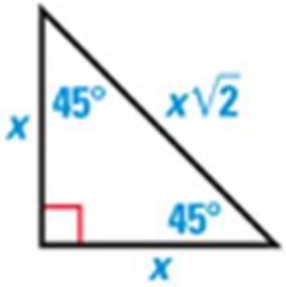
$$longer\ side = x\sqrt{3} = 8\ in\ (so\ x = \frac{8\sqrt{3}}{3})$$

$$shorter\ side = x = \frac{8\sqrt{3}}{3}\ \text{in}$$

$$hypotenuse = 2x = 2\left(\frac{8\sqrt{3}}{3}\right)$$

$$= \frac{16\sqrt{3}}{3}\ in$$

C. $45° - 45° - 90°$ Triangles



Given the hypotenuse is 6 cm, what is each leg length?

$$hypotenuse = x\sqrt{2} = 6\ cm$$

$$solving\ the\ equation, x = \frac{6\sqrt{2}}{2} = 3\sqrt{2}$$

$$leg\ length = x = 3\sqrt{2}\ cm$$