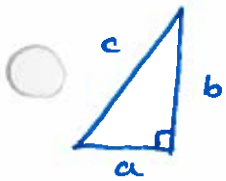


# C: Using the Pythagorean Relationship



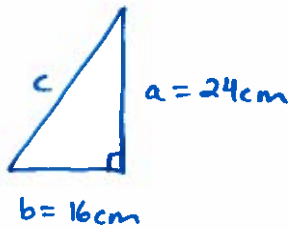
Remember:

$$a^2 + b^2 = c^2$$

\* c must be the hypotenuse.  
(across from the 90° angle)

## Examples:

1. Determine the length of the hypotenuse to the nearest tenth.



$$a^2 + b^2 = c^2$$

$$(24)^2 + (16)^2 = c^2$$

$$576 + 256 = c^2$$

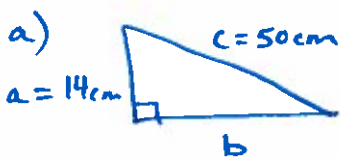
$$832 = c^2$$

$$\sqrt{832} = \sqrt{c^2}$$

\* square root both sides to cancel the square (2).

$$\boxed{28.8\text{cm} = c}$$

2. Determine the length of the leg for each triangle to the nearest tenth.



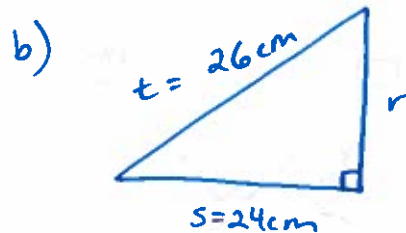
$$a^2 + b^2 = c^2$$

$$(14)^2 + b^2 = (50)^2$$

$$196 + b^2 = 2500$$

$$\begin{array}{r} 196 + b^2 = 2500 \\ -196 \quad -196 \\ \hline b^2 = 2304 \end{array} \quad \begin{array}{l} \text{subtract to isolate} \\ b \end{array}$$

$$\begin{array}{l} b^2 = 2304 \\ \sqrt{b^2} = \sqrt{2304} \\ \boxed{b = 48.0\text{cm}} \end{array}$$



$$a^2 + b^2 = c^2$$

$$r^2 + s^2 = t^2$$

$$r^2 + (24)^2 = (26)^2$$

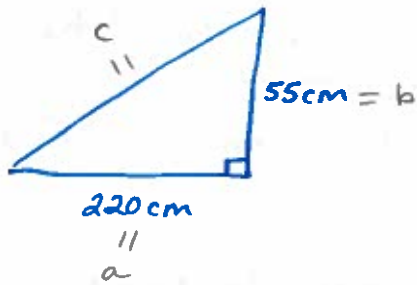
$$r^2 + 576 = 676$$

$$r^2 + 576 = 676$$

$$-576 \quad -576$$

$$\begin{array}{l} r^2 = 100 \\ \sqrt{r^2} = \sqrt{100} \\ \boxed{r = 10.0\text{cm}} \end{array}$$

3. The side view of a ramp is in the shape of a right triangle. Determine the length of the ramp, to the nearest centimetre.



$$a^2 + b^2 = c^2$$

$$(220)^2 + (55)^2 = c^2$$

$$48400 + 3025 = c^2$$

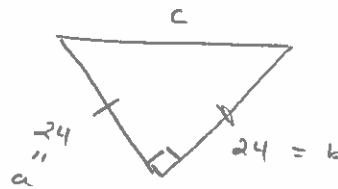
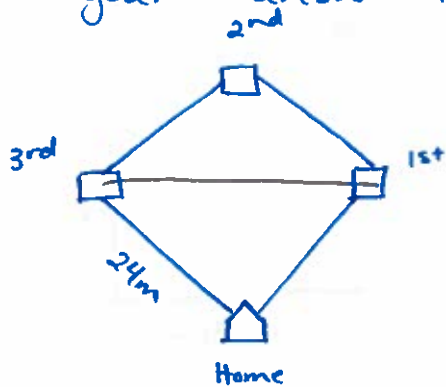
$$51425 = c^2$$

$$\sqrt{51425} = \sqrt{c^2}$$

$$226.77 = c$$

$$\boxed{227 \text{ cm} = c}$$

4. What is the minimum distance the player at third base has to throw the ball to get the runner out at first base? Express your answer to the nearest tenth.



$$a^2 + b^2 = c^2$$

$$24^2 + 24^2 = c^2$$

$$576 + 576 = c^2$$

$$1152 = c^2$$

$$\sqrt{1152} = \sqrt{c^2}$$

$$\boxed{33.9 \text{ m} = c}$$