

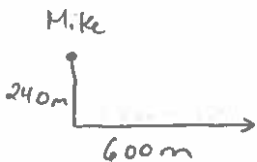
D: Applying Pythagorean's Theorem

Examples:

1. Will walks across a rectangular field in a diagonal line. Mike walks around two sides of the field. They meet at the opposite corner.

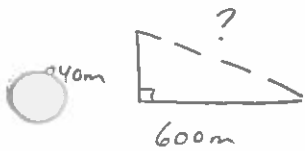


a) How far did Mike walk?



$$240 + 600m = \boxed{840m}$$

b) How far did Will walk?



$$a^2 + b^2 = c^2 \leftarrow \text{must be hypotenuse}$$

$$(240)^2 + (600)^2 = c^2$$

$$57600 + 360000 = c^2$$

$$\sqrt{417600} = c$$

$$\boxed{646.2198m = c}$$

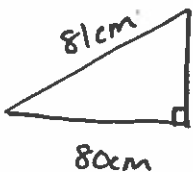
c) Who walked further? By how much?

$$840 - 646.2198$$

$$= 193.7802$$

$$\boxed{\text{Mike by } 193.7802m}$$

2. What is the height of the wheel chair ramp? Answer to the nearest tenth.



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

$$80^2 + b^2 = 81^2$$

$$6400 + b^2 = 6561$$

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$$\begin{array}{r} -6400 \\ \hline b^2 = 161 \end{array}$$

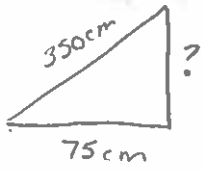
$$\rightarrow \sqrt{b^2} = \sqrt{161}$$

$$b = 12.688$$

$$\boxed{b = 12.7cm}$$

3. A 350 cm ladder is leaning against a wall. In order to be safe the ladder must be between 75 cm and 115 cm away from the wall. What are the minimum and maximum distance up the wall the ladder can reach to the nearest cm?

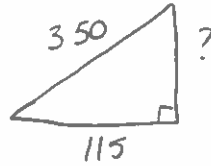
Max



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 75^2 + b^2 &= 350^2 \\
 5625 + b^2 &= 122500 \\
 -5625 & \quad -5625 \\
 \hline
 b^2 &= 116875 \\
 \sqrt{b^2} &= \sqrt{116875}
 \end{aligned}$$

$$b = 342 \text{ cm}$$

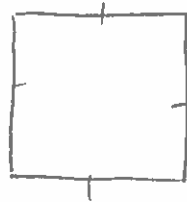
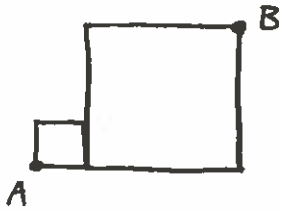
Min



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 115^2 + b^2 &= 350^2 \\
 13225 + b^2 &= 122500 \\
 -13225 & \quad -13225 \\
 \hline
 b^2 &= 109275 \\
 \sqrt{b^2} &= \sqrt{109275}
 \end{aligned}$$

$$b = 331 \text{ cm}$$

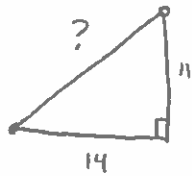
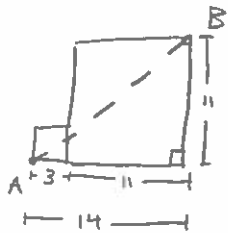
4. The large square has a perimeter of 44 mm and the small square has an area of 9 mm². What is the shortest distance between A and B to the nearest hundredth.



$$\begin{aligned}
 P &= 4s \\
 \frac{44}{4} &= \frac{4s}{4} \\
 11 \text{ mm} &= s
 \end{aligned}$$



$$\begin{aligned}
 A &= s^2 \\
 \sqrt{9} &= \sqrt{x^2} \\
 3 \text{ mm} &= x
 \end{aligned}$$



$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 14^2 + 11^2 &= c^2 \\
 196 + 121 &= c^2 \\
 \sqrt{317} &= \sqrt{c^2}
 \end{aligned}$$

$$17.80 \text{ mm} = c$$

Assignment: Pg. 110 #3-14