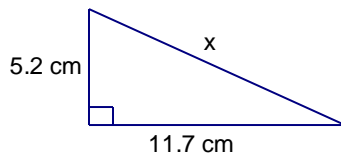


Course: MFM2P Gr. 10 AppliedLesson: 2 -2Unit: Right Triangle TrigonometryTopic: Pythagorean Theorem# *homework check:* Lesson 2 - 2# *note:* Pythagorean Theorem

The Pythagorean Theorem is used to find the unknown sides in a right angled triangle. The theorem states that the hypotenuse squared is equal to the sum of the squares of the other two sides. The hypotenuse of a right angled triangle is always the longest because it is located opposite the largest angle (which is 90 degrees in measure). The theorem can be written algebraically as  $c^2 = a^2 + b^2$  where  $c$  represents the hypotenuse and  $a$  and  $b$  represent the other two sides (in no particular order). For example, find the measure of the side indicated:

a)



*In this triangle, the hypotenuse is represented by  $x$  so will replace the  $c$  in the formula.*

$$x^2 = 5.2^2 + 11.7^2$$

$$x^2 = 27.04 + 136.89$$

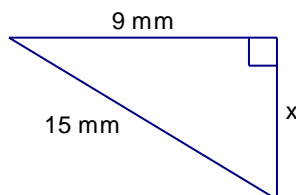
$$x^2 = 163.93$$

$$x = \sqrt{163.93}$$

$$x = 12.803515 \text{ and round to the nearest tenth (or one decimal place)}$$

$$x = 12.8\text{cm}$$

b)



*In this triangle, the hypotenuse is 15mm in length and will replace  $c$  in the formula.*

$$15^2 = 9^2 + x^2$$

$$225 = 81 + x^2$$

$$225 - 81 = x^2$$

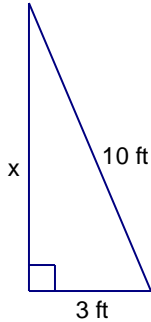
$$144 = x^2$$

$$x = \sqrt{144}$$

$$x = 12\text{mm}$$

- c) Brad must use a ladder to reach a trapped kitten in a tree. The kitten is 12 ft from the ground, but he only has a 10 foot ladder that must be placed at least 3 ft from the base of the tree. How far will he have to reach to get the kitten?

*Draw a picture to help!*



*In this triangle, the hypotenuse is 10 ft and will replace  $c$  in our formula.*

$$10^2 = 3^2 + x^2$$

$$100 = 9 + x^2$$

$$100 - 9 = x^2$$

$$91 = x^2$$

$$x = \sqrt{91}$$

$$x = 9.53939$$

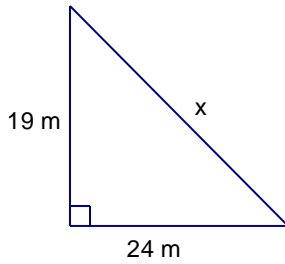
$$x = 9.5 \text{ ft}$$

Therefore, Brad needs to reach  $12 - 9.5 = 2.5$  ft in the air.

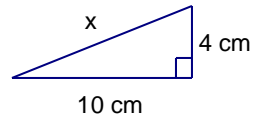
✚ *homework assignment: Lesson 2 - 2*

**Lesson 2 – 2: Pythagorean theorem****1. Find the missing measure.**

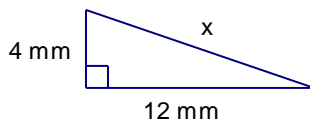
a)



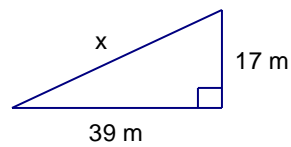
b)



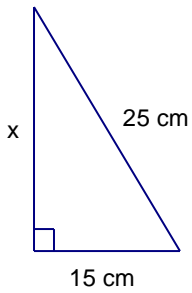
c)



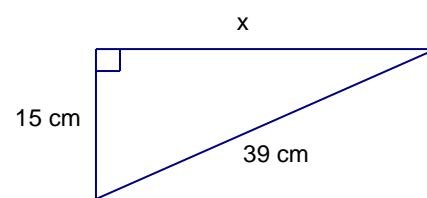
d)

**2. Find the length of the indicated side to the nearest tenth.**

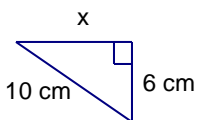
a)



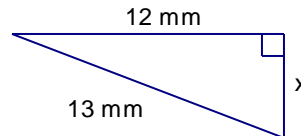
b)



c)



d)



**3. Mandy walks home by cutting through a park. The park is 125m long and 85m side. How much distance does she save by cutting through rather than walking all the way around the park?**

4. A wheelchair ramp must be built at the front door. The vertical rise is 1 m. If the ramp is to be 14.6m long, how far from the door will the ramp start? Sketch a diagram and solve.

5. Clarence is finishing his basement. He needs sheets of drywall that are 4' by 8' but his doorway is only 85" by 36" wide. Because of the corners in the stairwell, the sheets of drywall must be carried vertically. Will the drywall fit through the doorway? Show your work.

6. The distance between bases in a baseball diamond is 27.5m. If a line drive to third base is made, how far does the third baseman need to throw the ball to first base?

7. Aaron uses a ladder to reach up a tree. The ladder is 12 feet long and he places it so the base is 3 feet from the tree. How far up the tree does Aaron reach?

8. Find the unknown measure.

