

## Section 2.2 Using Tangent to Find a Missing Length

To use trigonometry to find a missing length, being able to cross multiply is very helpful.

**Example 1** Determine the value of  $x$ .

a)  $\frac{x}{15} = \frac{3}{5}$

b)  $\frac{4.1}{3} = \frac{8.2}{x}$

c)  $0.58 = \frac{18}{x}$

**Your Turn**

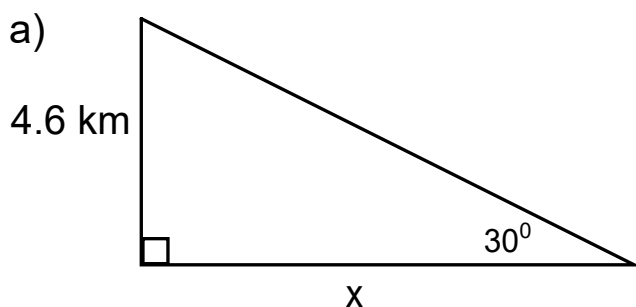
d)  $\frac{x}{12.5} = \frac{0.8}{4}$

e)  $0.63 = \frac{x}{3}$

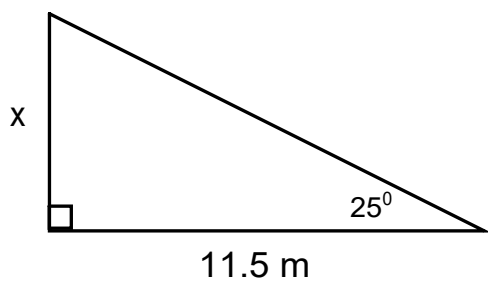
f)  $1.75 = \frac{3.36}{x}$

**Example 2**

Find the length of the missing side. Round your answer to one decimal place where possible. **Hint: Label the sides first!**

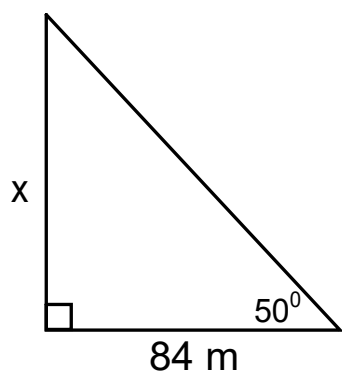


b)

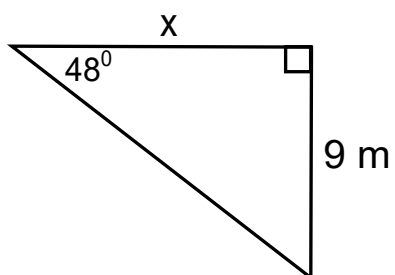


Your Turn

c)



d)

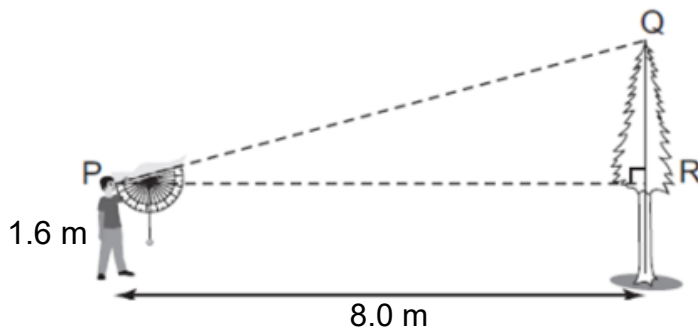


### Example 3

A wire supports a flagpole. The wire reaches 25 ft up the flagpole. The wire forms a  $65^\circ$  with the ground. How far is the wire from the base of the flagpole?

### Example 4

A student stood 8.0 m from the base of a tree. She used a protractor to sight the top of the tree. The angle shown on the protractor was  $35^\circ$ . The student held the protractor 1.6 m above the ground. Determine the height of the tree to one decimal place.



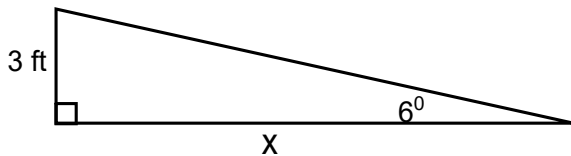
### Example 5

In  $\triangle ABC$ ,  $\angle A = 90^\circ$ ,  $\angle B = 26^\circ$ , and  $AC = 4.5$  m. Determine the area of the triangle to the nearest tenth of a meter.

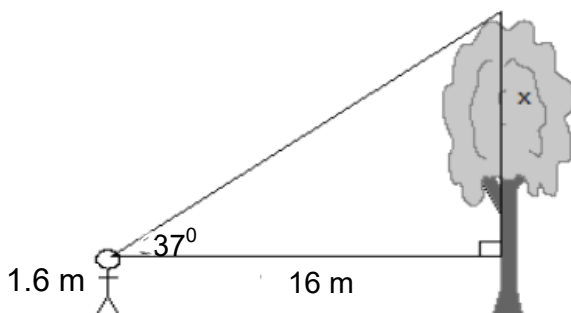
### Example 6 Your Turn

- a) The base of a ladder is on level ground 1.8m from the wall. The ladder leans against the wall. The angle between the ladder and the ground is  $62^\circ$ . How far up does the ladder reach to the nearest tenth of a meter?

- b) Laura builds a wheelchair ramp for her mother. The angle the ramp makes with the ground has to be  $6^\circ$ . The landing is 3 ft off the ground. The total length of the walkway available to build the ramp is 30 ft. Will the ramp fit on the walkway?



- c) Refer to the diagram below. What is the height of the tree to one decimal place?



#### Work Book Questions

p.82 - 83 #3a, 4a, 5a, 6, 7, 8,  
9a, 11, 12

#### Extra Practice Questions

p.82 - 83 #3bcd, 4bc, 5bc, 9b, 14