

MCF3M

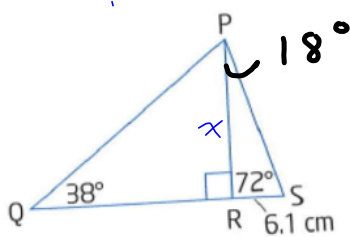
Lesson 3

Solving Problems with Right Triangles

Work through each of the examples below. Hints are provided. The full solutions are in your textbook for you to either check your final answer or to provide a hint if you are stuck.

Example 1

Determine the length of side PQ in the diagram below.



$$\tan 72^\circ = \frac{x}{6.1}$$

$$x = 6.1 \tan 72^\circ$$

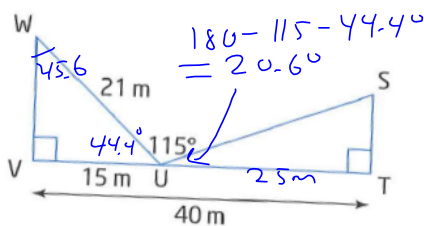
$$x \approx 18.8 \text{ cm}$$

$$\sin 38^\circ = \frac{18.8}{PQ}$$

$$PQ = \frac{18.8}{\sin 38^\circ} \quad PQ \approx 30.4 \text{ cm}$$

Example 2

Determine the length of side ST in the diagram below.



$$\sin W = \frac{15}{21}$$

$$W = \sin^{-1}\left(\frac{15}{21}\right)$$

$$W = 45.6^\circ$$

$$\tan 20.6 = \frac{ST}{25}$$

$$ST = 25 \tan 20.6^\circ$$

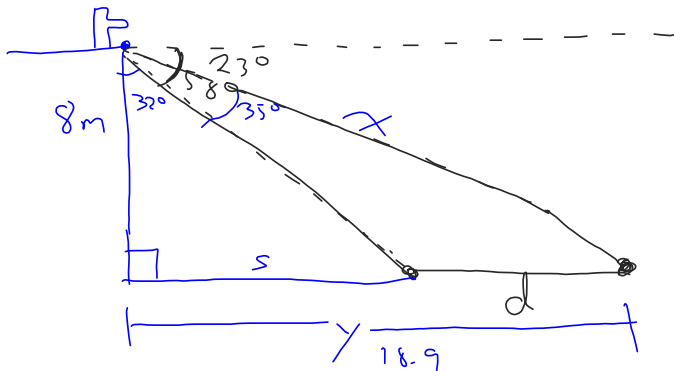
$$ST \approx 9.4 \text{ m}$$

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Example 3

A security camera is mounted 8m above the ground on the outside of a building. Two vehicles are parked directly in front of the camera. Police determine that the angles of depression from the camera to each vehicle are 23° and 58° . How far apart were the vehicles?



$$\cos 67^\circ = \frac{8}{x}$$

$$x = \frac{8}{\cos 67^\circ}$$

$$x \doteq 20.5 \text{ m}$$

$$\tan 32^\circ = \frac{s}{8}$$

$$s = 8 \tan 32^\circ$$

$$s \doteq 5 \text{ m}$$

$$20.5^2 = 8^2 + y^2$$

$$20.5^2 - 8^2 = y^2$$

$$y \doteq 18.9 \text{ m}$$

$$d \doteq 18.9 \text{ m} - 5 \text{ m}$$

$$d \doteq 13.9 \text{ m}$$

Text page 200 #1 – 5, 8, 9 and page 191 #17