

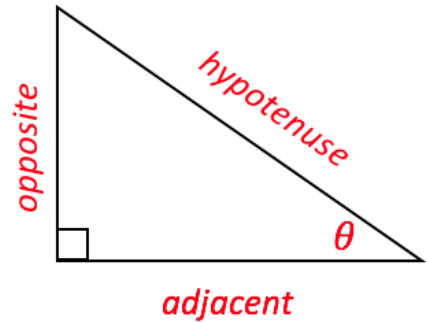
L5 – Problems in 2 and 3 Dimensions

MCR3U

Jensen

_____ are used to solve triangles that contain a right angle.

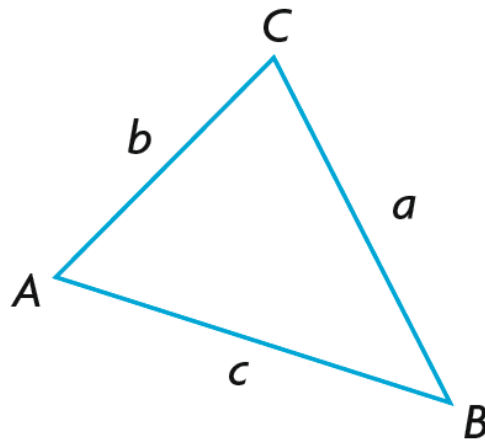
$$\sin \theta = \frac{\textit{opposite}}{\textit{hypotenuse}} \quad \cos \theta = \frac{\textit{adjacent}}{\textit{hypotenuse}} \quad \tan \theta = \frac{\textit{opposite}}{\textit{adjacent}}$$



The _____ and _____ are used to solve oblique triangles. An oblique triangle is any triangle that is NOT a right triangle.

Sine Law can be used if you know:

- i) 2 sides and one angle opposite a given side
- ii) 2 angles and any side

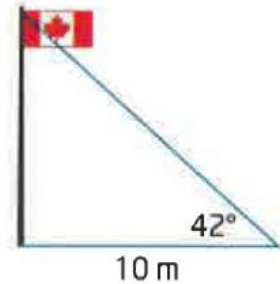


The Cosine Law can be used if you know:

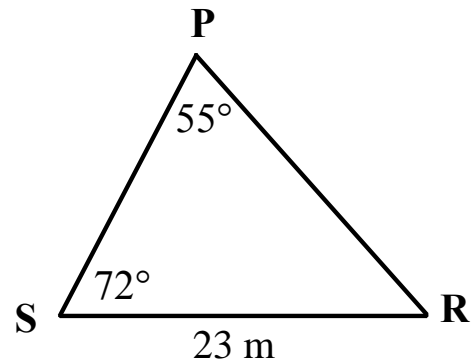
- i) 2 sides and the angle contained by those 2 sides
- ii) All 3 sides

Part 1: Problems in 2 Dimensions

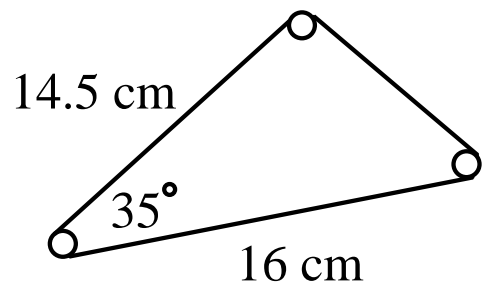
Example 1: Jonathan needs a new rope for his flagpole but is unsure of the length required. He measures a distance of 10m away from the base of the pole. From this point, the angle of elevation to the top of the pole is 42° . What is the height of the pole, to the nearest tenth of a meter?



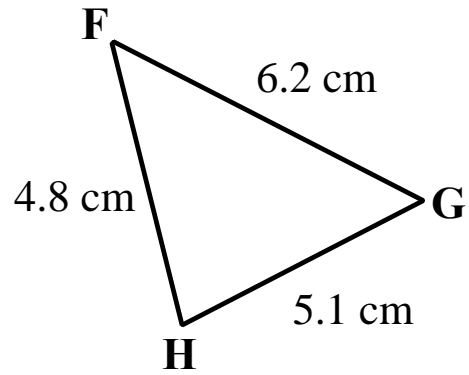
Example 2: Pam, Steven and Rachel are standing on a soccer field. Steven and Rachel are 23m apart. From Steven's point of view, the other two are separated by 72° . From Pam's point of view, the others are separated by an angle of 55° . Determine the distance from Pam to Rachel.



Example 3: A drive belt wraps around three pulleys as shown. Find the perimeter of the drive belt to the nearest tenth of a cm.

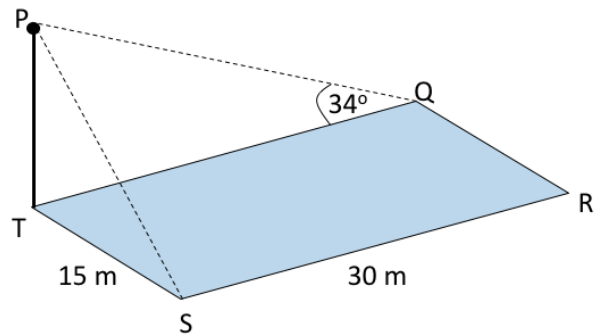


Example 4: Find the measure of angle G

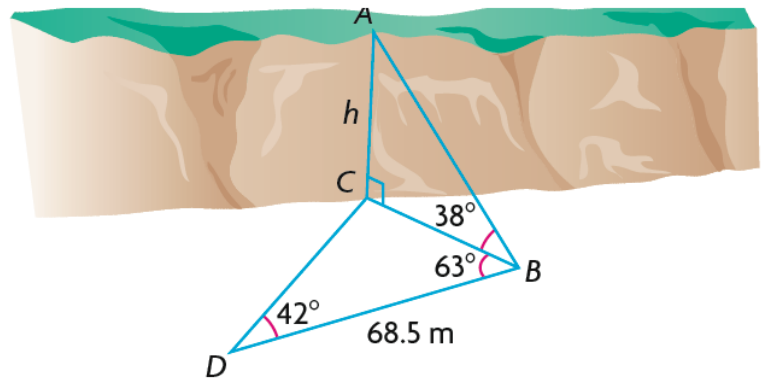


Part 2: Problems in 3 Dimensions

Example 4: A vertical flag pole TP stands in the corner of a rectangular field QRST. Using the information given in the diagram, calculate (a) The height of the flag pole and (b) The angle of elevation of P from S. Round answers to nearest tenth.



Example 5: From point B, Manny estimates the angle of elevation to the top of a cliff as 38° . From point D, 68.5 meters away from Manny, Joe estimates the angle between the base of the cliff, himself, and Manny to be 42° , while Manny estimates the angle between the base of the cliff, himself, and his friend Joe to be 63° . What is the height of the cliff to the nearest tenth of a meter?



Example 6: Emma is on a 50 meter high bridge and sees two boats anchored below. From her position, boat A has a bearing of 230° and boat B has a bearing of 120° . Emma estimates the angles of depression to be 38° for boat A and 35° for boat B. How far apart are the boats to the nearest meter?

