

# IB Math Studies 2

# BELL WORK

Rodrigo takes a sighting to the top of the flagpole from point P. He then moves 20 metres further away from the flagpole to point Q and takes a second sighting. The information is shown in the diagram. How high is the flagpole?

Handwritten solution for the flagpole problem:

$$P = \frac{20}{\sin 25} = \frac{P}{\sin 28} = 37.8 \text{ m}$$

$$Q = \frac{20}{\sin 25} = \frac{Q}{\sin 28} = 22.2 \text{ m}$$

$$\sin 53 = \frac{x}{22.2} \Rightarrow x = 22.2 \sin 53$$

$$180 - 53 = 127$$

Final answer:  $17.7 \text{ m}$

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Handwritten solution for the flagpole problem:

$$\frac{\sin Q}{q} = \frac{\sin A}{a}$$

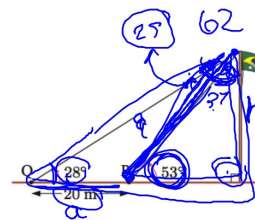
$$\frac{\sin 28}{q} = \frac{\sin 25}{20}$$

$$q = 22.21728$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 53 = \frac{h}{22.21728}$$

$$22.21728 (\sin 53) = h$$

$$17.7 = h$$


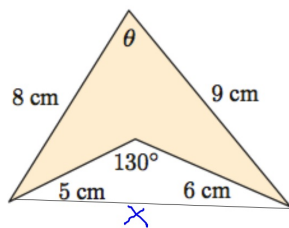
Assignment:

- 15 F # 1, 2, 6
- 15 G # 1, 4, 6
- 15 H.1 # 3
- 15 H.2 # 3

$$x^2 = 5^2 + 6^2 - 2 \cdot 5 \cdot 6 \cdot \cos 130$$

$$x = 9.97834$$

$$\cos \theta = \frac{8^2 + 9^2 - 9.97834^2}{2 \cdot 8 \cdot 9}$$



$$\frac{\sin x}{7} = \frac{\sin 48}{5}$$

$$\sin x = \frac{7 \sin 48}{5}$$

$$\sin x = 1.04 \dots$$

$$\sin = \frac{O}{H}$$

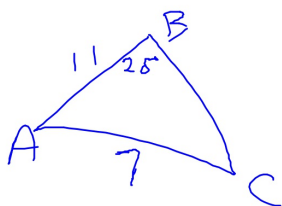
# Chapter 15

## Trigonometry

- A Labelling right angled triangles
- B The trigonometric ratios
- C Using trigonometry in geometric figures
- D Problem solving using trigonometry
- E 3-dimensional problem solving
- F Areas of triangles
- G The cosine rule
- H The sine rule
- I Using the sine and cosine rules
- J The ambiguous case (Extension)

Syllabus reference: 5.2, 5.3, 5.4

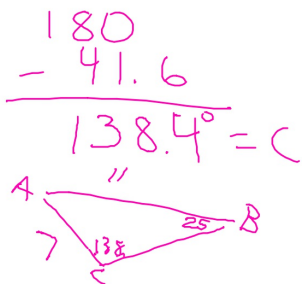
Find the measure of angle  $C$  in triangle  $ABC$  if  $AC = 7$  cm,  $AB = 11$  cm, and angle  $B$  measures  $25^\circ$ .



$$\frac{\sin 25}{7} = \frac{\sin C}{11}$$

$$\frac{11 \sin 25}{7} = \sin C$$

$$C = 41.6^\circ$$



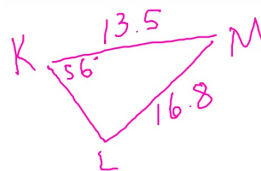
## J THE AMBIGUOUS CASE (EXTENSION)

The problem of finding angles using the sine rule can be complicated because there may be two possible answers. We call this situation the **ambiguous case**.

Recall from Investigation 2 that

$$\sin \theta = \sin(180^\circ - \theta)$$

Find the measure of angle  $L$  in triangle  $KLM$  given that angle  $LKM$  measures  $56^\circ$ ,  $LM = 16.8$  m, and  $KM = 13.5$  m.



$$\frac{\sin 56}{16.8} = \frac{\sin L}{13.5}$$

$$\frac{(13.5) \sin 56}{16.8} = \sin L$$

$$L = 41.8 \text{ or } \cancel{138.2}$$

Assignment:

15 I # 3, 5, 7, 8, 12

15 J # 1, 2

DUE MONDAY

*Review Set 15 C*  
*will be due Tuesday*