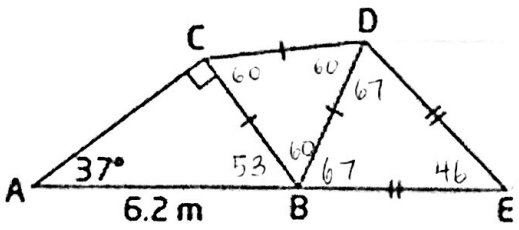
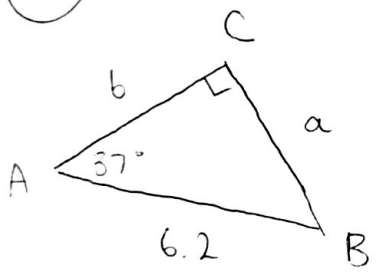
Problem Solving With Acute Triangles | MPM2D

1) A section of a bridge truss design is shown. Find the total length of the beams required to build the section, to the nearest tenth of a metre.



(1)



$\sin 37° = \frac{a}{6.2}$

$a = 6.2 \sin 37°$

$a = 3.7\text{m}$

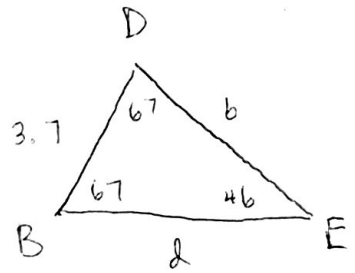
$b^2 = c^2 - a^2$

$= 6.2^2 - 3.7^2$

$= 24.75$

$b = 5.0\text{m}$

(2)



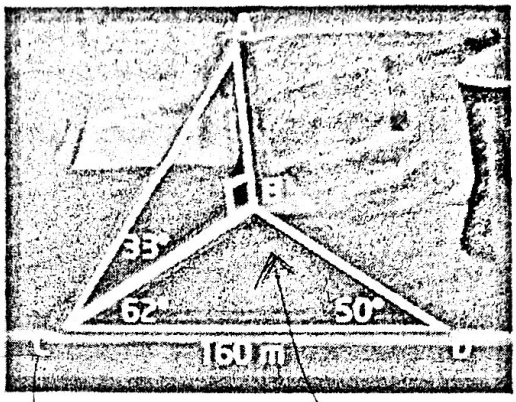
$\frac{b}{\sin 67} = \frac{3.7}{\sin 46}$

$b = \frac{3.7 \sin 67}{\sin 46}$

$b = 4.7\text{m}$

$\text{Total} = 5.0 + 6.2 + 3(3.7) + 2(4.7) = 31.7\text{m}$

2) Find the height of the cliff shown, to the nearest metre.



① Find BC:

$$\frac{BC}{\sin 50^\circ} = \frac{160}{\sin 68}$$

$$BC = \frac{160 \sin 50}{\sin 68}$$

$$BC = 132.2 \text{ m}$$

② Find AB

$$\tan 33^\circ = \frac{AB}{132.2}$$

$$AB = 132.2 \tan 33$$

$$AB = 85.9 \text{ m}$$

$180 - 62 - 50 = 68^\circ$

The cliff height is 85.9m.