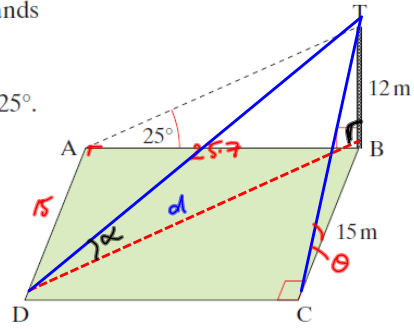


2. The diagram shows a vertical radio mast [BT] which stands at the corner of a horizontal rectangular plot ABCD. The mast is 12 m in height and  $|BC| = 15$  m. The angle of elevation of the top of the mast from A is  $25^\circ$ .
- Find the length of [AB].
  - Calculate the angle of elevation of the top of the mast from C.
  - Find |DB|.
  - Calculate the angle of elevation of the top of the mast from D.
- Give each answer correct to one decimal place.



ToA

$\tan 25^\circ = \frac{12}{x}$

$x = \frac{12}{\tan 25^\circ} = 25.7 \text{ m}$

ToA

$\theta = \tan^{-1}\left(\frac{12}{15}\right) = 38.7^\circ$

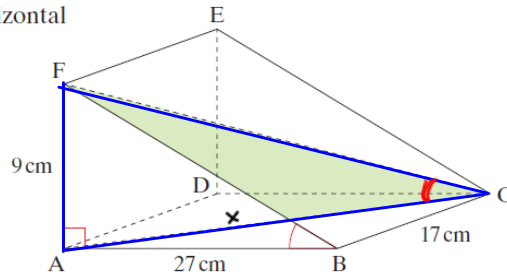
$a^2 = b^2 + c^2$

$d = \sqrt{15^2 + 25.7^2} = 29.8 \text{ m}$

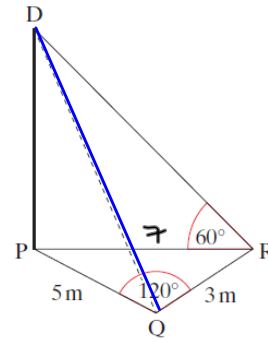
ToA

$\alpha = \tan^{-1}\left(\frac{12}{29.8}\right) = 21.9^\circ$

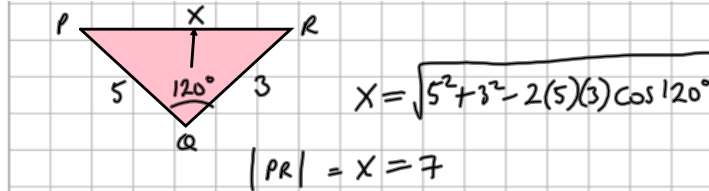
4. In the given model of a ramp, ABCD is a horizontal rectangle and ADEF is a vertical rectangle. Find (i)  $|\angle ABF|$  (ii) |AC| (iii)  $|\angle ACF|$ . Give each answer correct to one decimal place.



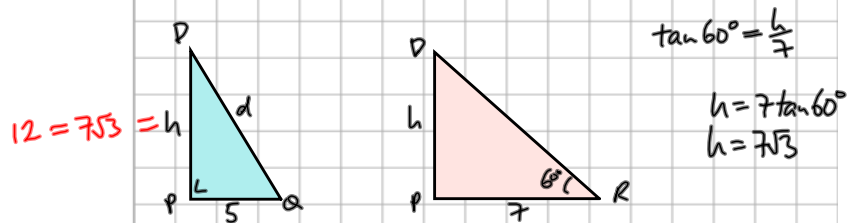
5. P, Q and R are points on a horizontal plane.  
 [PD] is a vertical mast.  
 The angle of elevation of D from R is  $60^\circ$ .  
 If  $|PQ| = 5\text{ m}$ ,  $|QR| = 3\text{ m}$  and  $|\angle PQR| = 120^\circ$ ,  
 find  
 (i)  $|PR|$   
 (ii)  $|DQ|$ , correct to the nearest metre.



$$a^2 = b^2 + c^2 - 2bc \cos A$$



TOA



$$a^2 = b^2 + c^2$$

$$d = \sqrt{(7\sqrt{3})^2 + 5^2} = 2\sqrt{43} \approx 13\text{ m}$$

Question 6

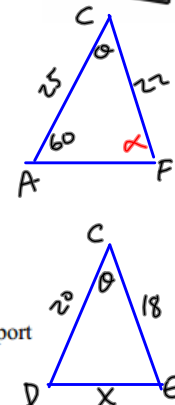
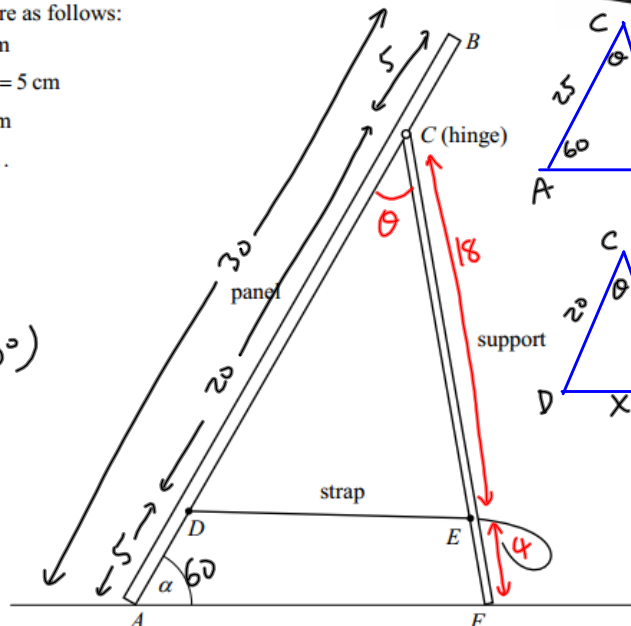
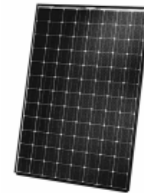
(7.5 MARKS)

- (a) A stand is being used to prop up a portable solar panel. It consists of a support that is hinged to the panel near the top, and an adjustable strap joining the panel to the support near the bottom.

By adjusting the length of the strap, the angle between the panel and the ground can be changed.

The dimensions are as follows:

- $|AB| = 30\text{ cm}$
- $|AD| = |CB| = 5\text{ cm}$
- $|CF| = 22\text{ cm}$
- $|EF| = 4\text{ cm}$ .



(i)  $|DE| = ?$  (if  $\alpha = 60^\circ$ )

(ii) max value of  $\alpha$ .