Examiner only

15. *(a)* A vertical post AB is 15 m from a point C on horizontal ground. The angle of elevation of the top of the post from the point C is 67°. Calculate the height of the post.

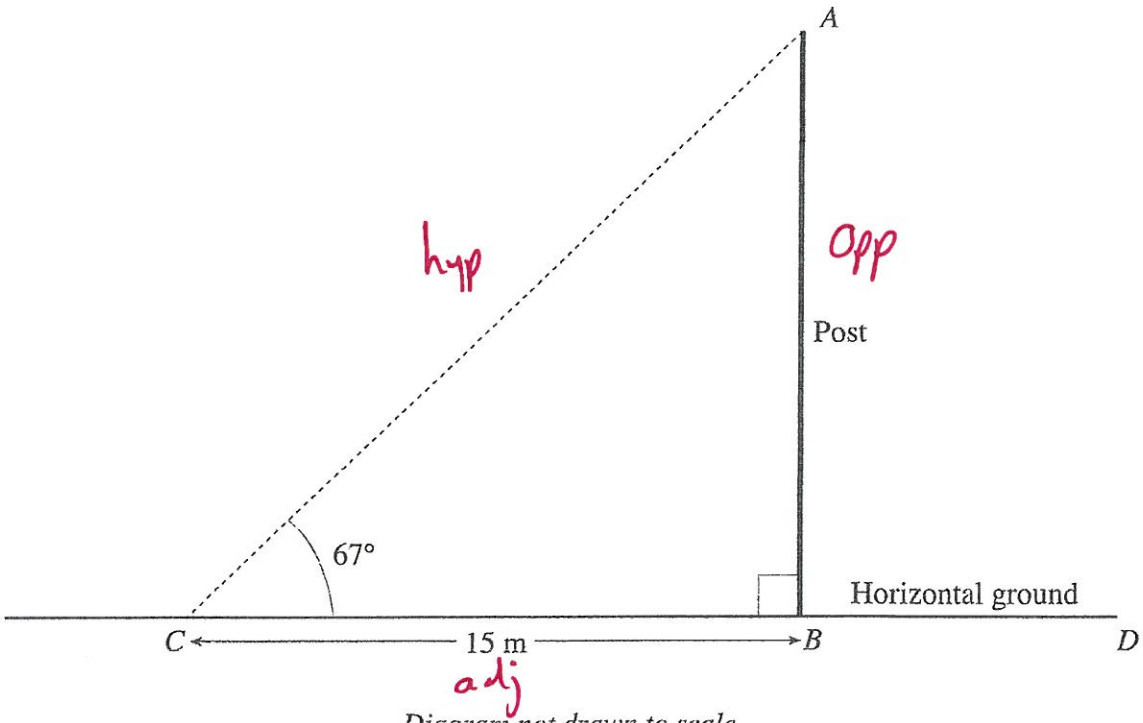


Diagram not drawn to scale.

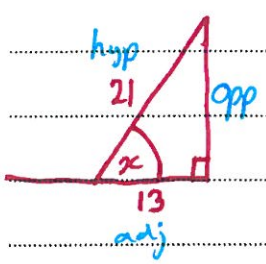
opp = tan 67 × adj

AB = tan 67 × 15

= 35.3 m

[3]

(b) A ladder, 21 m long, is placed against a vertical wall. The foot of the ladder is 13 m from the wall on horizontal ground. Calculate the angle which the ladder makes with the horizontal.



$\cos x = \frac{adj}{hyp}$

$\cos x = \frac{13}{21}$

$x = \cos^{-1}\left(\frac{13}{21}\right) = 51.8°$

[3]

10. In the diagram ABC is a straight line and BDE is a straight line perpendicular to it. It is given that $AD = 36$ m, $BC = 49$ m, $D\hat{A}B = 43°$ and $E\hat{C}B = 54°$.

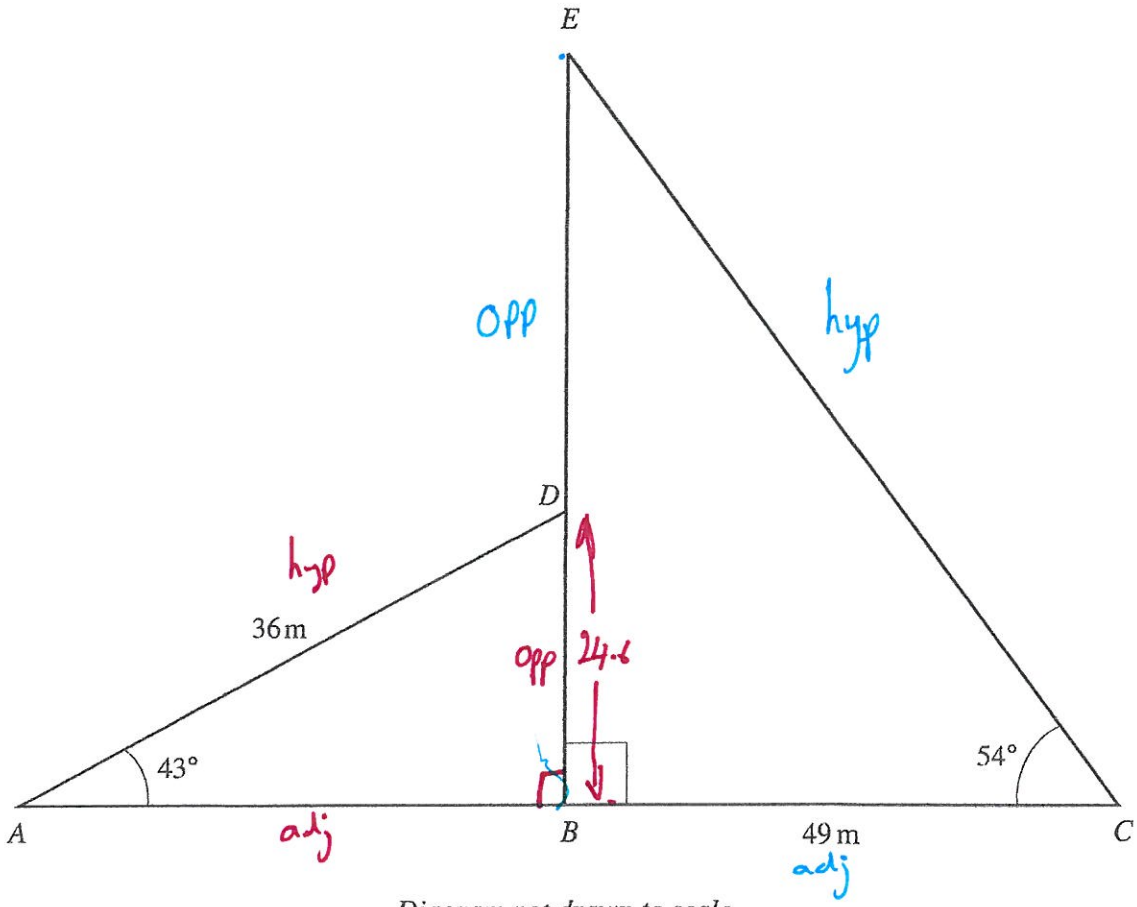


Diagram not drawn to scale.

Calculate the length of DE.

SOH

opp = Sin 43 × hyp

DB = Sin 43 × 36

= 24.6 m

TOA

opp = tan 54 × adj

BE = tan 54 × 49

= 67.4 m

So DE = 67.4 − 24.6 = 42.8 m

[6]

Examiner only

18.

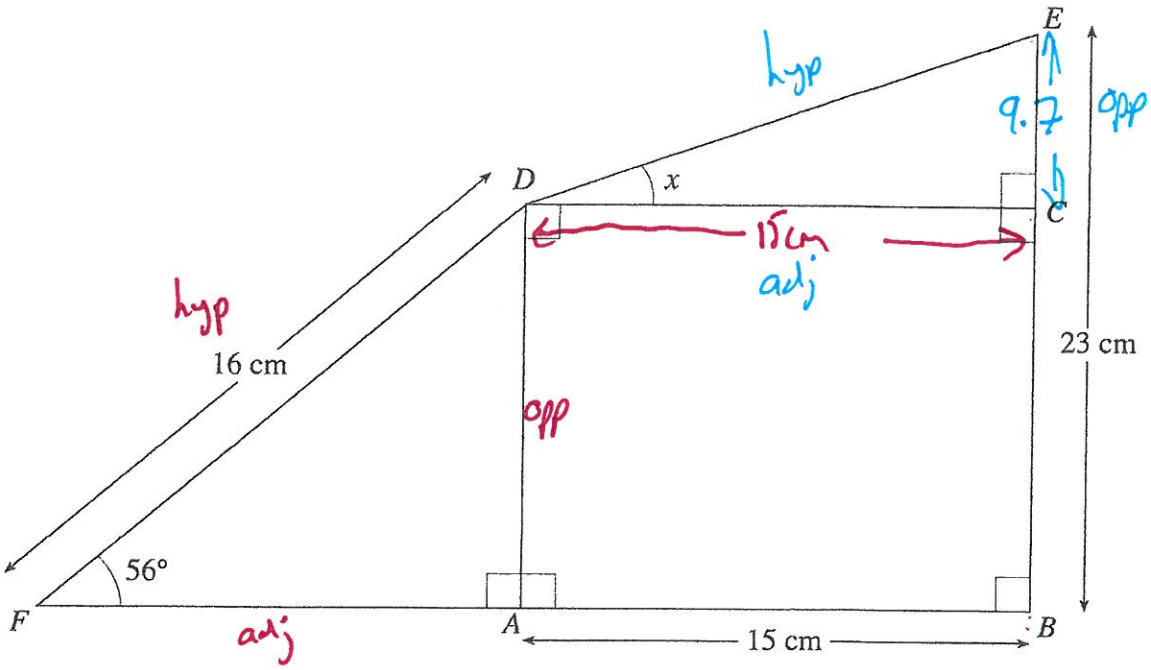


Diagram not drawn to scale.

Find the size of the angle marked x in the above diagram.

SOH

$\text{opp} = \sin 56 \times \text{hyp}$

$DA = \sin 56 \times 16$

$= 13.3 \text{ cm}$

So $CE = 23 - 13.3 = 9.7$

TOA

$\tan x = \frac{\text{opp}}{\text{adj}}$

$\tan x = \frac{9.7}{15}$

$x = \tan^{-1}\left(\frac{9.7}{15}\right) = 32.9^\circ$

[6]

10. A building stands on the horizontal ground *ABC*. The point *E* is 23 metres below the top of the building along the vertical face, *DEB*. The point *C* is 46 m from the point *B*. The angle of elevation of the point *E* from the point *C* is 37°.

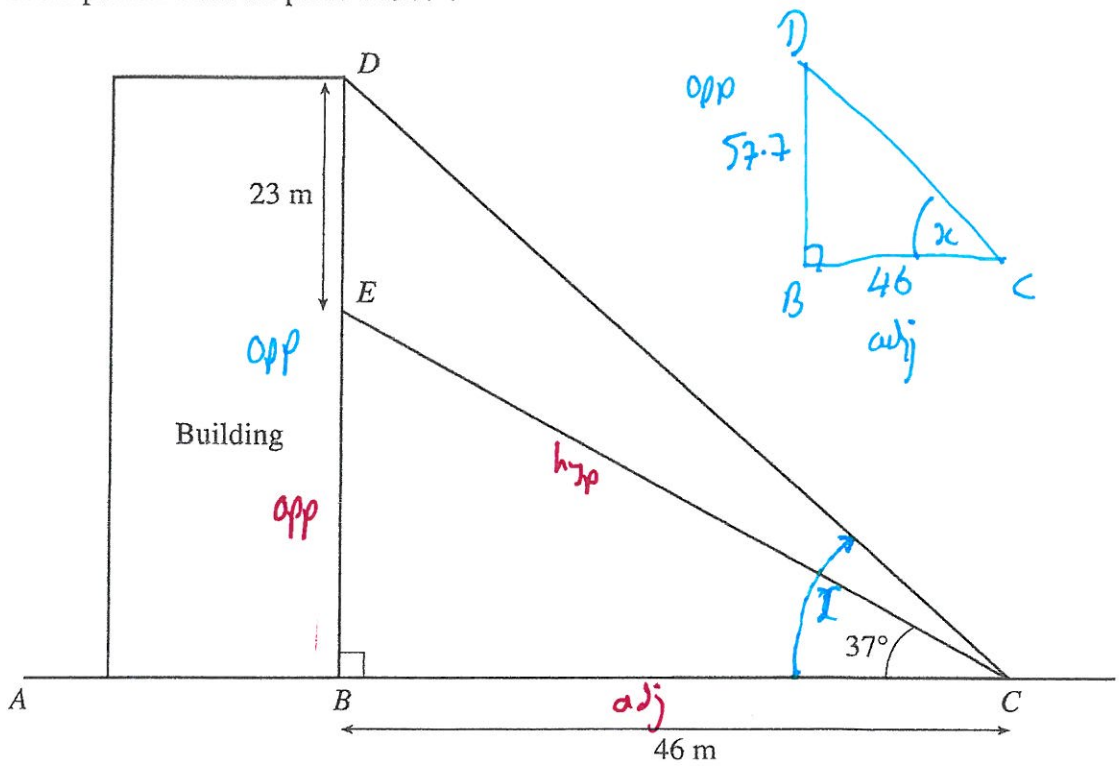


Diagram not drawn to scale.

(a) Calculate the height of the building.

SOH CAH TOA

opp = tan 37 × adj

BE = tan 37 × 46

= 34.7 m

height of building = 34.7 + 23 = 57.7 m

[3]

(b) Calculate the angle of elevation of the top of the building from the point *C*.

SOH CAH TOA

$\tan x = \frac{opp}{adj}$

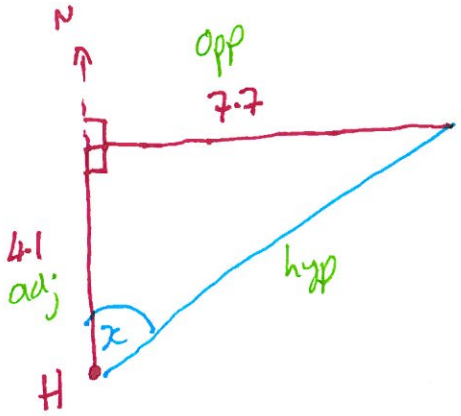
$\tan x = \frac{57.7}{46}$

$x = \tan^{-1}\left(\frac{57.7}{46}\right) = 51.4^{\circ}$

[3]

Examiner only

13. *(a)* From a harbour a yacht sails 4·1 km North.
It then sails 7·7 km East before dropping the anchor.
Calculate the bearing of the yacht from the harbour.



$\tan x = \frac{opp}{adj}$

$\tan x = \frac{7.7}{4.1}$

$x = \tan^{-1}\left(\frac{7.7}{4.1}\right) = 62.0^\circ$

Bearing 062°

[5]