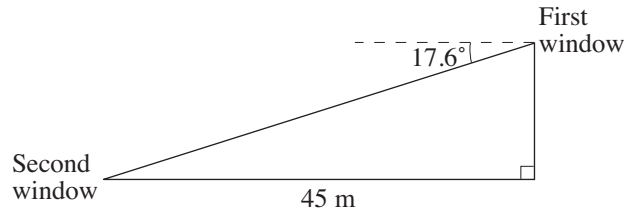


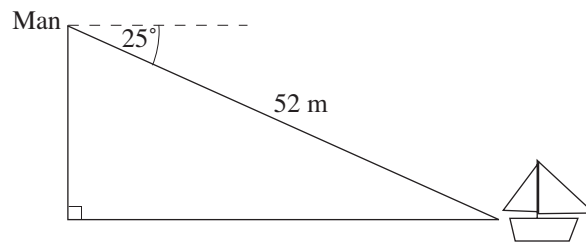
UNIT 35 *Trigonometric Problems***CSEC Revision Test**

1. Two buildings are 45 metres apart. From a window in one of them, the angle of depression of a window in the other building is 17.6° . How far below the first window is the second window?
Give your answer correct to 2 significant figures.



(2 marks)

2. A man at the top of a lighthouse sights a boat at an angle of depression of 25° . If the boat is at a distance of 52 metres from the man, how far away is the boat from the foot of the lighthouse?
Give your answer correct to the nearest metre.

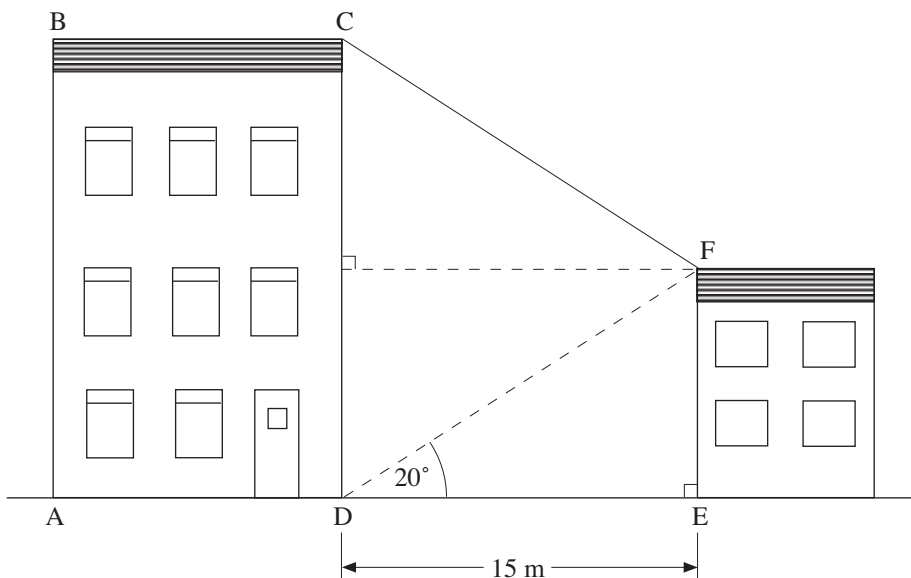


(2 marks)

UNIT 34 *Trigonometric Problems*

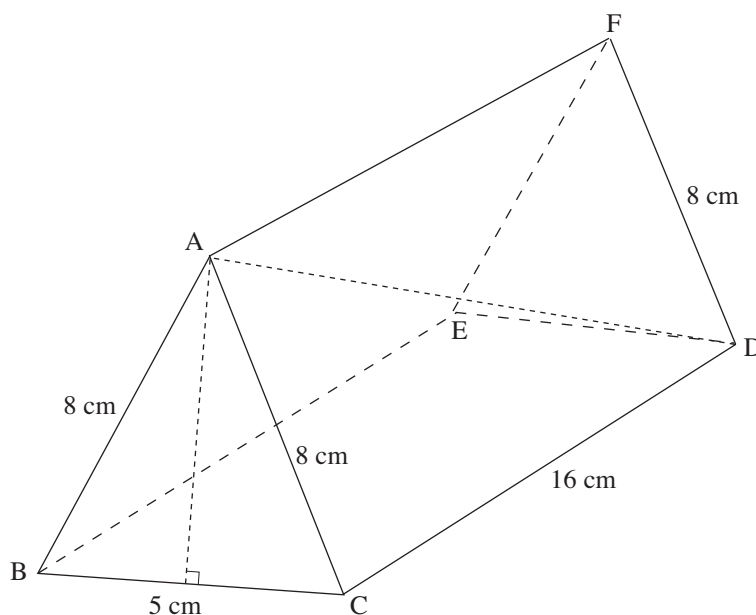
CSEC Revision Test

3. The diagram, which is not to scale, shows a side view of two buildings.



- (a) (i) Length $DE = 15$ m. Angle $FDE = 20^\circ$. Calculate the height EF .
 (ii) A telephone wire stretches from C to F . The length $CF = 20.9$ m.
 Calculate the size of angle DFC . (5 marks)
- (b) Name four of the labelled points in the diagram which are vertices of a trapezium. (1 mark)

4. $ABCDEF$ is a triangular prism, 16 cm long, as shown.
 Calculate the size of the angle between AD and the base $BCDE$.

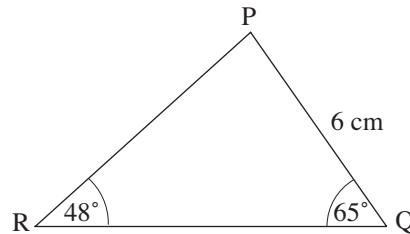


(6 marks)

UNIT 35 *Trigonometric Problems*

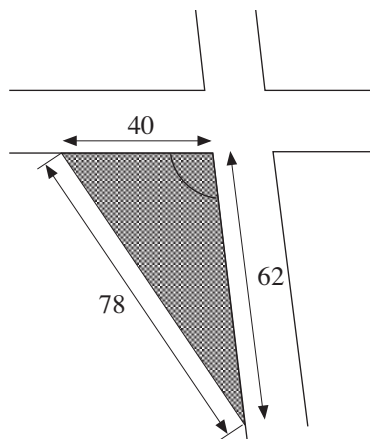
CSEC Revision Test

5. In the diagram, angle $PRQ = 48^\circ$, angle $PQR = 65^\circ$ and $PQ = 6$ cm .
Use the sine rule to calculate the length of PR .



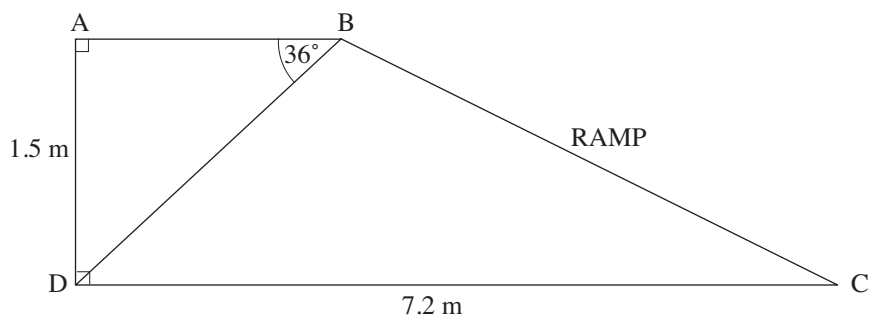
(3 marks)

6. A piece of land at a street corner is in the shape of a triangle of sides 40 metres, 62 metres and 78 metres as shown. Find the size of the angle at the street corner.



(4 marks)

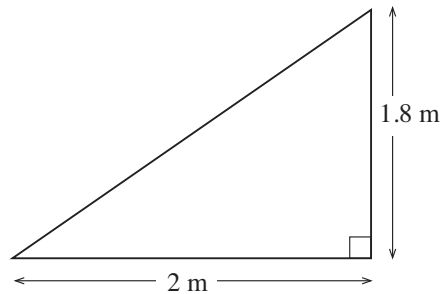
7. In the diagram below calculate the length of BC .



(5 marks)

UNIT 35 *Trigonometric Problems***CSEC Revision Test**

8. A vertical stick of height 1.8 m casts a shadow of length 2 m on the horizontal as shown in the diagram below, **not drawn to scale**.

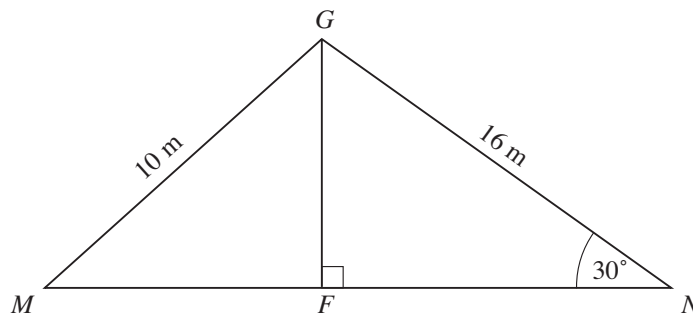


Calculate, to the NEAREST degree, the angle of elevation of the sun.

(4 marks)

(CXC)

9. The diagram below, **not drawn to scale**, shows a vertical flagpole, FG , which is kept in place by two ropes, GM and GN , fixed at M and N on level horizontal ground. MFN is a straight line.



The length of GM is 10 m and the length of GN is 16 m. The angle of elevation of G from N is 30° .

Calculate correct to the nearest whole number

- (a) the length, in metres, of the flagpole
 (b) the angle of elevation of G from M .

(3 marks)

(4 marks)

(CXC)

UNIT 35 *Trigonometric Problems*

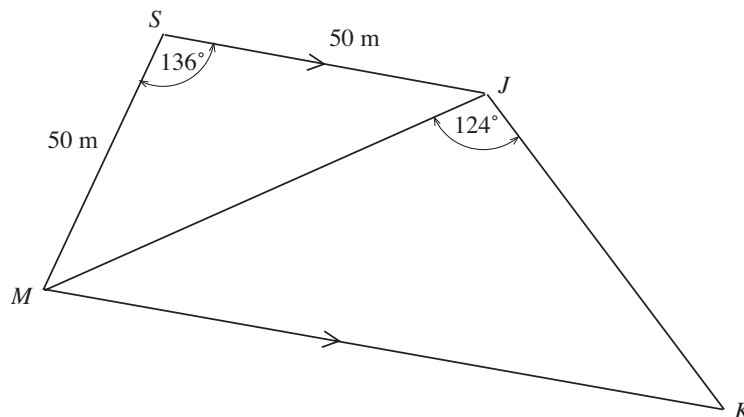
CSEC Revision Test

10. Points O , P and Q are in the same horizontal plane. P is 15 m away from O on a bearing of 040° from O . Q is on a bearing of 130° from O , and $PQ = 17$ m.

- (a) Sketch a diagram to show the positions of O , P and Q . Clearly indicate North on your diagram.
- (b) Calculate the distance OQ . (6 marks)

(CXC)

11.



The figure $SJKM$ above, **not drawn to scale**, is a trapezium with SJ parallel to MK , angle $MJK = 124^\circ$, angle $MSJ = 136^\circ$, and $SM = SJ = 50$ metres.

- (a) Calculate the size of
 - (i) angle SJM
 - (ii) angle JKM . (3 marks)
- (b) Calculate, expressing your answer correct to ONE decimal place, the length of
 - (i) MJ
 - (ii) JK . (6 marks)

(CXC)

12. Port M , is due south of a lighthouse, L . A ship leaves Port M and sails 200 km on a bearing of 60° to Port K . Port K is directly east of the lighthouse.

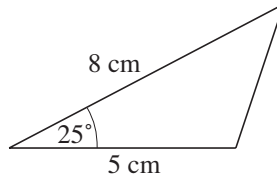
- (a) Sketch a diagram to represent this information.
At L and K , draw dotted lines to show the direction of north.
- (b) Label CLEARLY on your diagram
 - (i) the points L , M and K
 - (ii) the angle of 60° , which shows the bearing of K from M
 - (iii) the line segment representing 200 km. (4 marks)
- (c) Calculate, to the NEAREST kilometre, the distance LK . (3 marks)
- (d) Indicate on your diagram the angle, x , which shows the bearing of M from K . (1 mark)

(CXC)

UNIT 35 *Trigonometric Problems*

CSEC Revision Test

13. Find the area of the triangle.



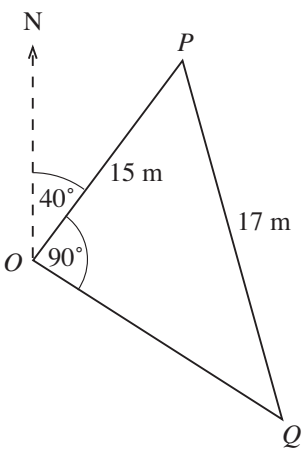
(2 marks)

TOTAL MARKS: 64

UNIT 35 *Trigonometric Problems*

CSEC Revision Test

ANSWERS

1. 14.3 m M1 A1 (2 marks)
- 2.. 47.1 m M1 A1 (2 marks)
3. (a) (i) 5.46 m (ii) 64.1° (b) CFED M1 A1 M2 A1 B1 (6 marks)
4. $AD = \sqrt{320}$ M1 A1
 perpendicular distance from A to BC = $\sqrt{64 - 2.5^2}$; 25.1° M1 A1 M1 A1 (6 marks)
5. 7.32 cm M2 A1 (3 marks)
6. 97.4° M2 A2 (4 marks)
7. $DB \approx 2.552$, 5.35 m M1 A1 M2 A1 (5 marks)
8. $\tan \theta = \frac{1.8}{2} \Rightarrow \theta = 41.987$ M1 A1 A1
 $\Rightarrow \theta = 42^\circ$ to nearest degree A1 (4 marks)
9. (a) Length of flagpole $FG = 16 \sin 30^\circ$ M1 A1
 $= 8$ m A1
- (b) $\sin \hat{GMF} = \frac{8}{10}$ M1 A1
 angle of elevation = 53.130 A1
 $= 53^\circ$ to the nearest degree A1 (7 marks)
10. (a)  B2
- (b) $OQ^2 + 15^2 = 17^2$ (as angle $POQ = 90^\circ$) M1 A1
 $OQ^2 = 289 - 225$
 $= 64$ A1
 $OQ = 8$ m A1 (6 marks)

UNIT 35 *Trigonometric Problems*

CSEC Revision Test

ANSWERS

11. (a) (i) Triangle *SJM* is isosceles so

$$\hat{SJM} = \frac{180 - 136}{2} = \frac{44}{2} = 22^\circ \quad \text{M1 A1}$$

(ii) $\hat{JKM} = 180^\circ - (22^\circ + 124^\circ) = 34^\circ \quad \text{B1}$

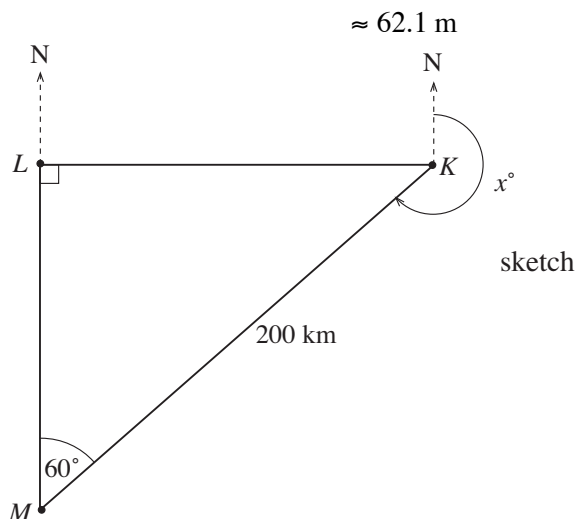
(b) (i) $MJ^2 = 50^2 + 50^2 - 2 \times 50 \times 50 \times \cos 136^\circ \quad \text{M1}$

$$= 8596.699... \quad \text{A1}$$

$$MJ = 92.7 \text{ m (to one decimal place)} \quad \text{A1}$$

(ii) $\frac{JK}{\sin \hat{MK}} = \frac{MJ}{\sin \hat{JK}} \Rightarrow JK = \frac{92.7 \times \sin 22^\circ}{\sin 34^\circ} \quad \text{M1 A1}$

12. (a) $\approx 62.1 \text{ m} \quad \text{A1} \quad (9 \text{ marks})$



(b) Label (i) points *L, M, K* B1

(ii) angle 60° B1

(iii) line representing 200 km B1

(c) $LK = 200 \times \sin 60^\circ \quad \text{M1}$

$$= 173.205 \quad \text{A1}$$

$$\approx 173 \text{ km to the nearest km} \quad \text{A1}$$

(d) Bearing, x° , shown on sketch B1 (8 marks)

13. area $= \frac{1}{2} \times 8 \times 5 \sin 25^\circ \quad \text{M1}$

$$= 8.45 \text{ cm}^2 \quad \text{A1} \quad (2 \text{ marks})$$

(TOTAL MARKS 64)