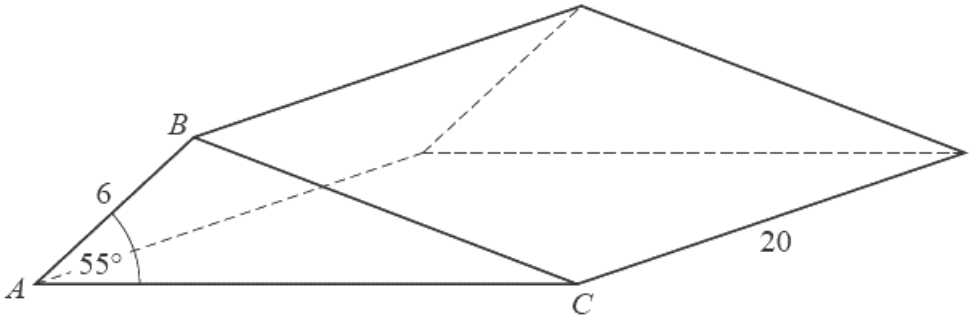
Trigonometry – 2023 O Level Math D 4024

1. Nov/2023/Paper_ 4024/21/No.9

(a)



The diagram shows a triangular prism.
$AB = 6\,\text{cm}$, angle $BAC = 55°$ and the length of the prism is 20 cm.
The area of triangle ABC is $34.4\,\text{cm}^2$.

(i) Calculate the volume of the prism.
Give the units of your answer.

.... [2]

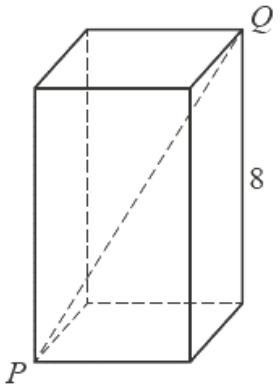
(ii) Show that $AC = 14.0\,\text{cm}$, correct to 3 significant figures.

[3]

(iii) Calculate the surface area of the prism.

..... cm^2 [5]

(b)

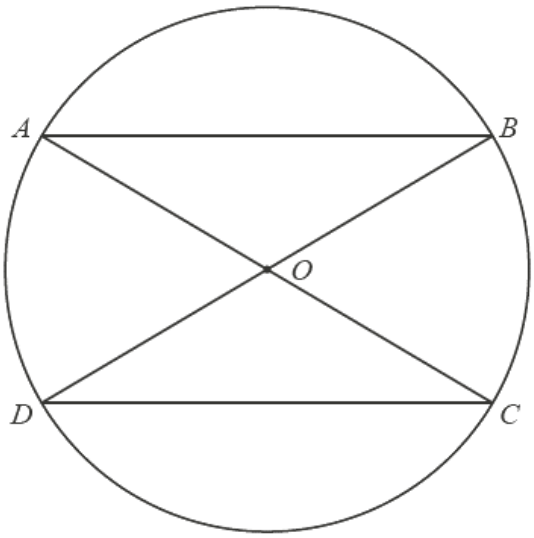


The diagram shows a cuboid with a square base.
The height of the cuboid is 8 cm.
The volume of the cuboid is $98\ \text{cm}^3$.

Calculate PQ.

..... cm [4]

2. Nov/2023/Paper_ 4024/21/No.10(b)



NOT TO SCALE

The diagram shows a circle, centre O, with diameters AC and BD.

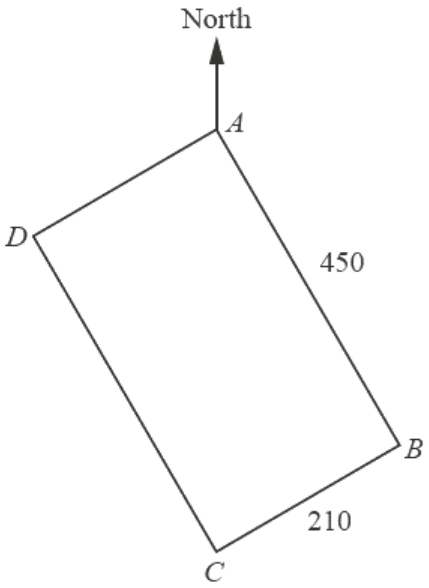
(b) The diameter of the circle is 10 cm and $AB = 9$ cm.

Calculate the difference between the circumference of the circle and the perimeter of the shaded shape.

..... cm [5]

3. Nov/2023/Paper_ 4024/22/No.9a(ii), (b)

(a)



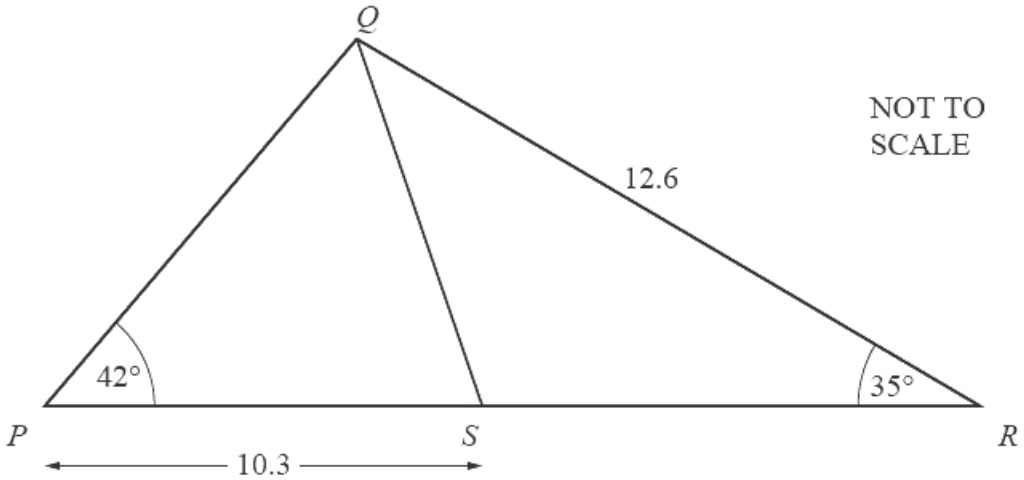
NOT TO SCALE

$ABCD$ is a rectangular field.
C is due south of A.
$AB = 450$ m and $BC = 210$ m.

(ii) Show that the bearing of D from A is 245°, correct to 3 significant figures.

[3]

(b)



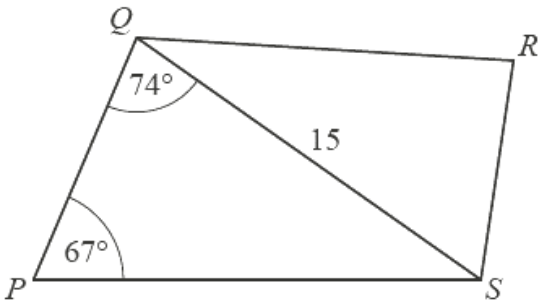
PQR is a triangle and S is a point on PR.
$PS = 10.3\text{cm}$, $QR = 12.6\text{cm}$, $Q\hat{P}S = 42°$ and $Q\hat{R}S = 35°$.

Calculate QS.

..... cm [5]

4. June/2023/Paper_ 4024/21/No.7(b)

(b)



NOT TO SCALE

The diagram shows quadrilateral $PQRS$.
$SQ = 15$ cm, $S\hat{P}Q = 67°$ and $P\hat{Q}S = 74°$.

(i) Calculate PS.

..... cm [3]

(ii) $P\hat{S}R = 96°$ and the area of triangle QRS is 63 cm^2.

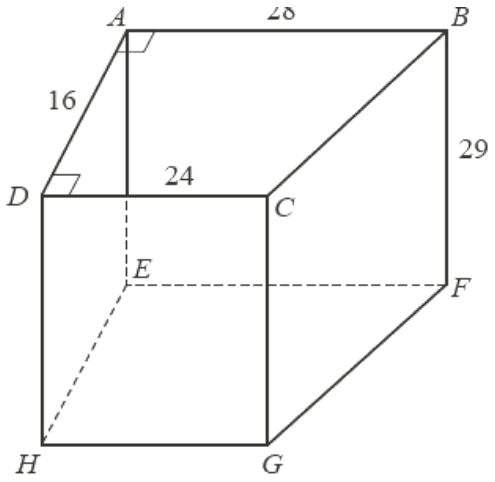
(a) Show that $SR = 10.0$ cm, correct to 1 decimal place.

[3]

(b) Calculate QR.

..... cm [3]

5. June/2023/Paper_ 4024/21/No.11



The diagram shows an open container on a horizontal surface.
The container is a prism with trapezium $ABCD$ as its cross-section.
$AB = 28$ cm, $DC = 24$ cm, $AD = 16$ cm and $BF = 29$ cm.
Angle ADC and angle DAB are right angles.

(a) Calculate angle DCB.

Angle $DCB =$ ..... [3]

(b) Khalil pours water into the empty container at a rate of 4000 cm^3/minute for 2 minutes.
He says that the container is now more than two thirds full.

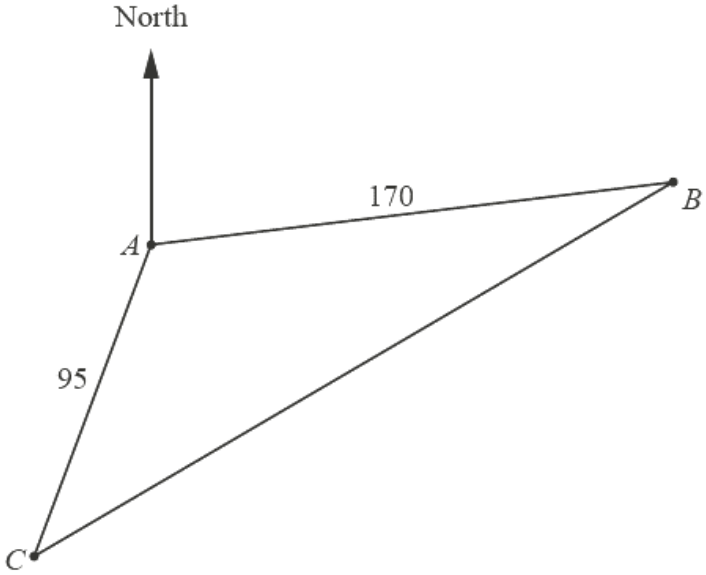
Is he correct?
Show your working.

[3]

(c) Calculate angle *DFH*.

Angle *DFH* = ... [3]

6. June/2023/Paper_ 4024/22/No.9



NOT TO SCALE

A, B and C are points on horizontal ground.
The bearing of B from A is 072°.
The bearing of C from A is 205°.
$AB = 170$ m and $AC = 95$ m.

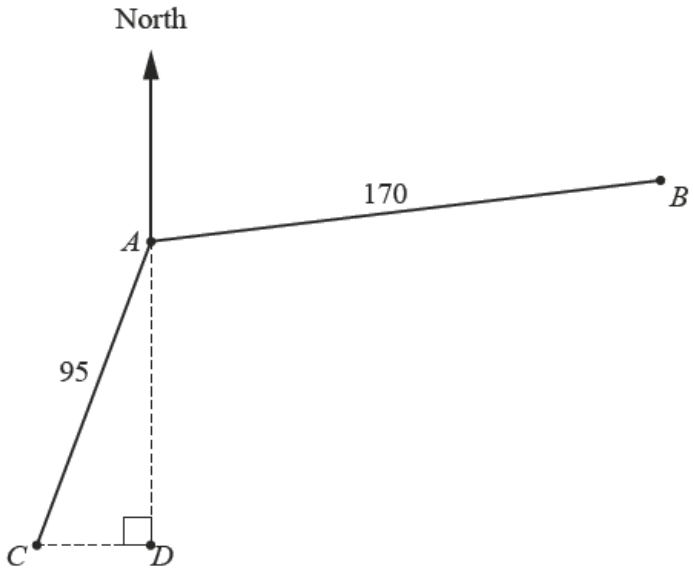
(a) Calculate BC.

..... m [4]

(b) Find the bearing of A from C.

..... [2]

(c)



NOT TO SCALE

The point D lies on the horizontal ground, due south of A and due east of C.

(i) Show that $AD = 86.1\,\text{m}$, correct to 1 decimal place.

[2]

(ii) A point X is at the top of a vertical mast at A.
The angle of elevation of X from B is 7°.

Calculate the angle of elevation of X from D.

..... [4]