Trigonometry – 2020 IGCSE 0580

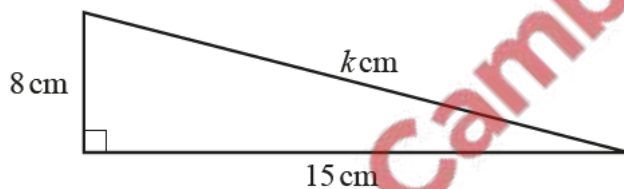**1.** Nov/2020/Paper_11/No.21

(a)

NOT TO SCALE

Calculate the value of x.

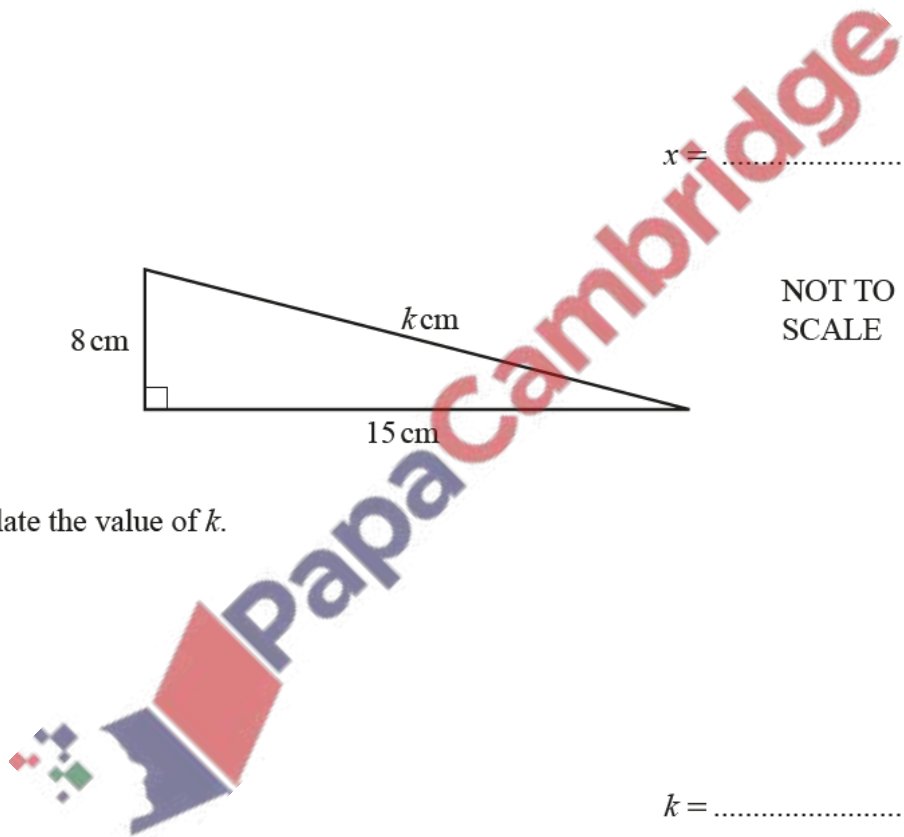$x =$ .... [2]

(b)

NOT TO SCALE

Calculate the value of k.

$k =$ .... [2]

2.
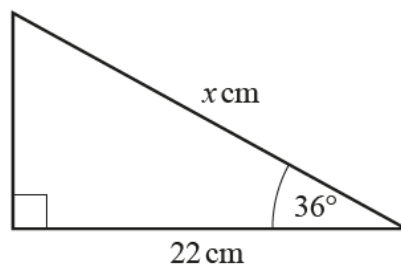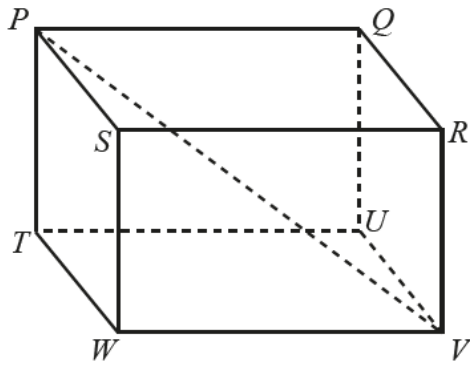
NOT TO
SCALE

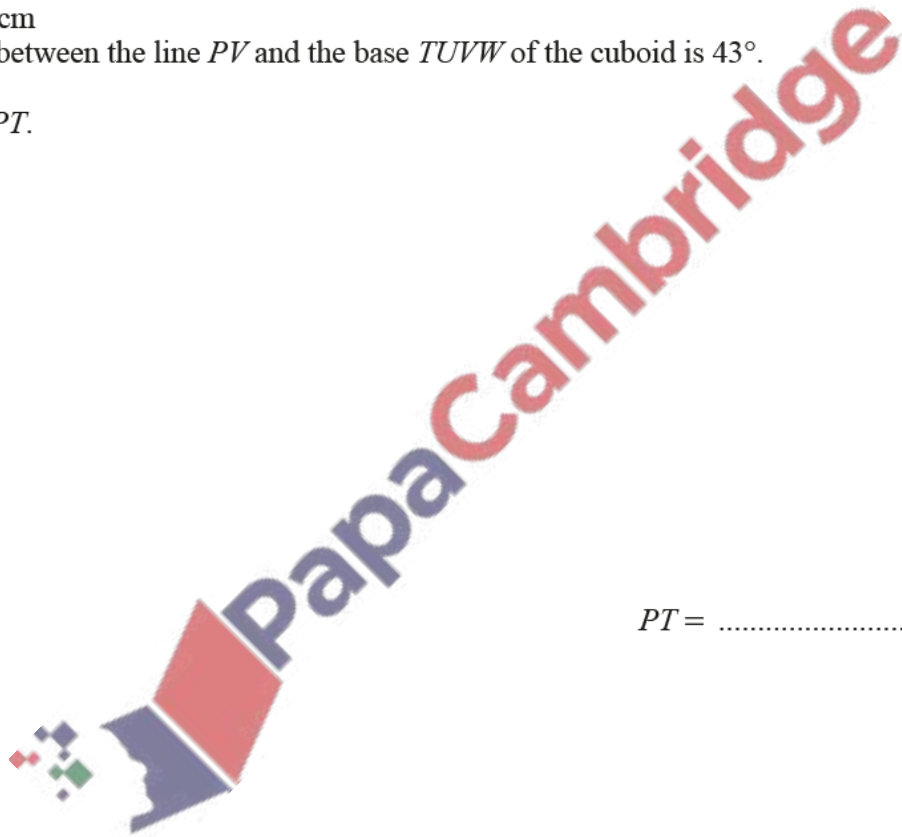Show that the value of x is 27.2, correct to 3 significant figures.

[3]
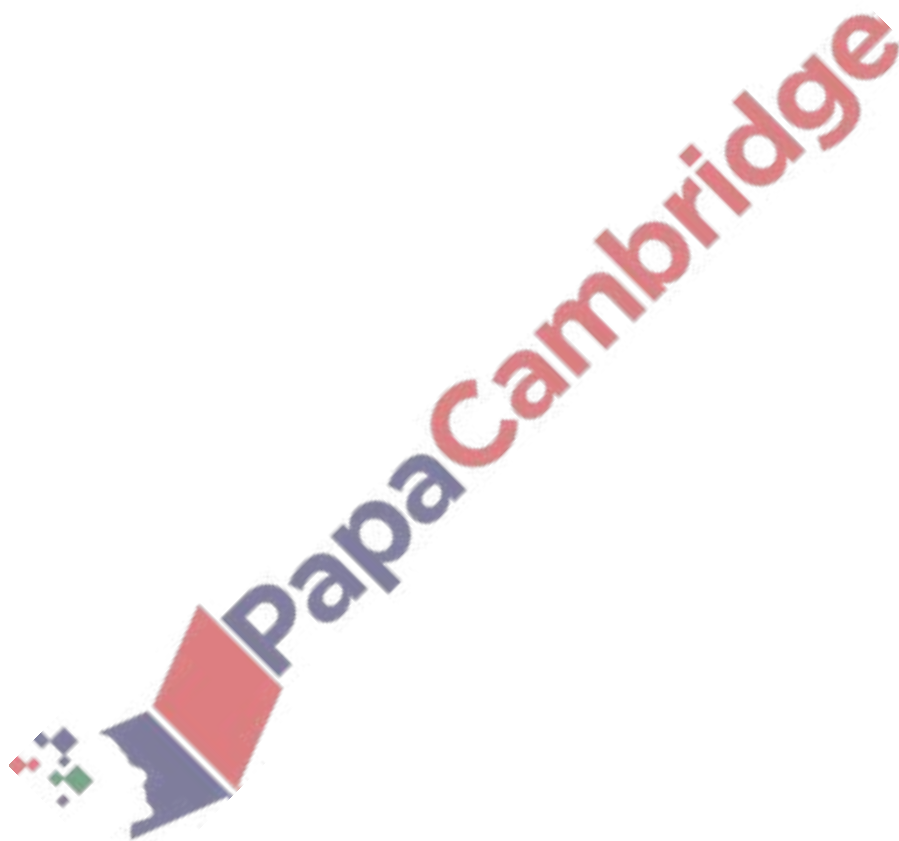
The diagram shows a cuboid $PQRSTUVW$.
$PV = 17.2\,cm$
The angle between the line PV and the base $TUVW$ of the cuboid is $43°$.

Calculate PT.

$PT =$ .... cm [3]

100°

8 cm

9 cm

$x°$
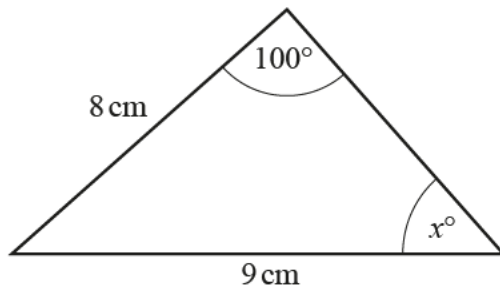
NOT TO
SCALE

(a) Calculate the value of x.

$x =$ .... [3]

(b) Calculate the area of the triangle.

.... cm^2 [3]
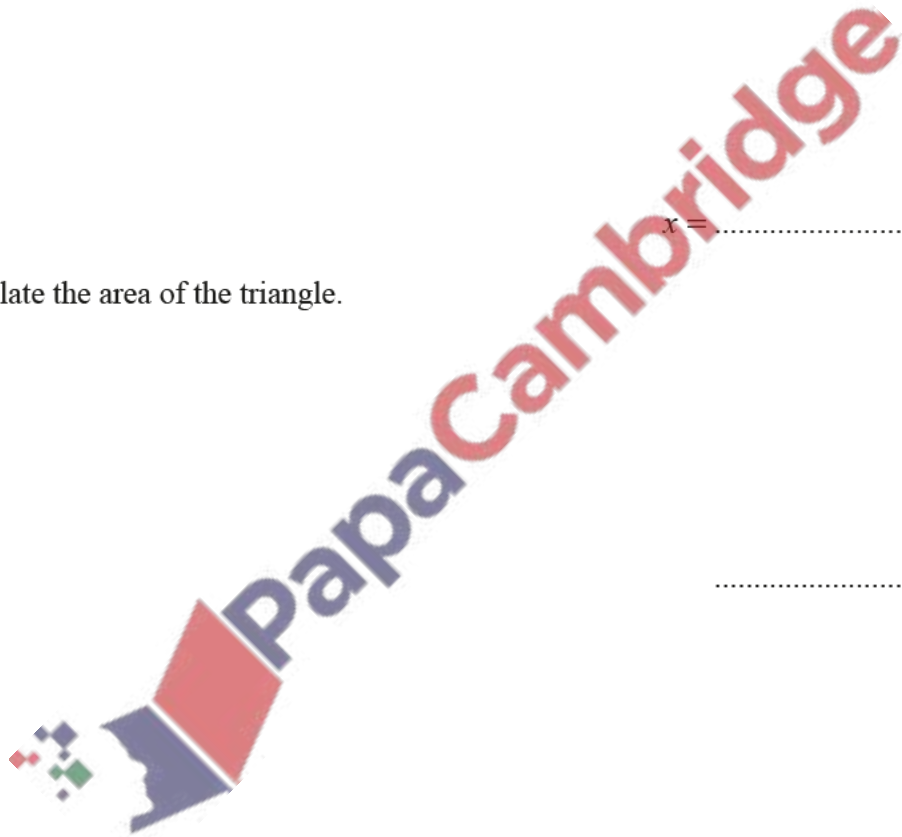
5.

Solve the equation $\tan x = 2$ for $0° \leqslant x \leqslant 360°$.

$x =$ .... or $x =$ .... [2]

6.
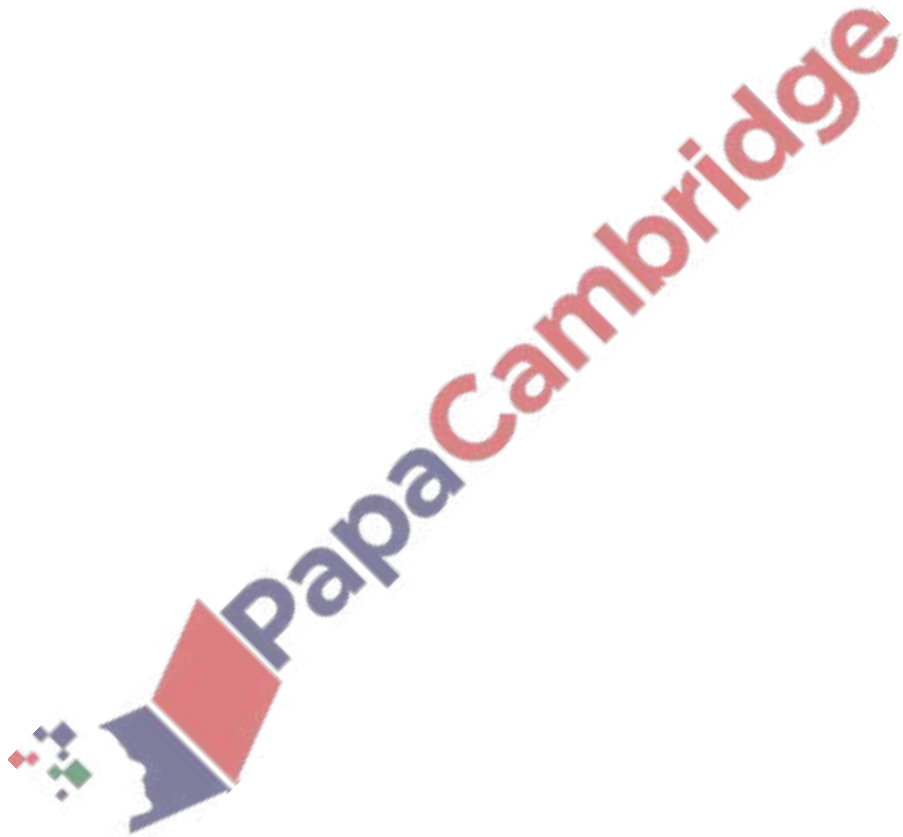
(c)

NOT TO
SCALE

Calculate the value of x.

$x =$ .... [3]

6
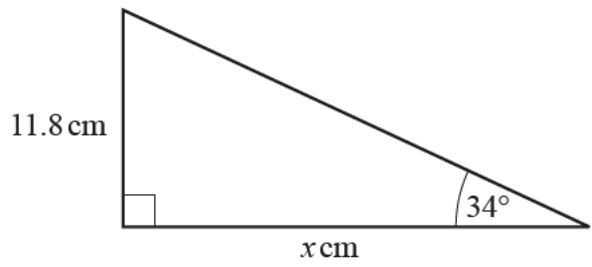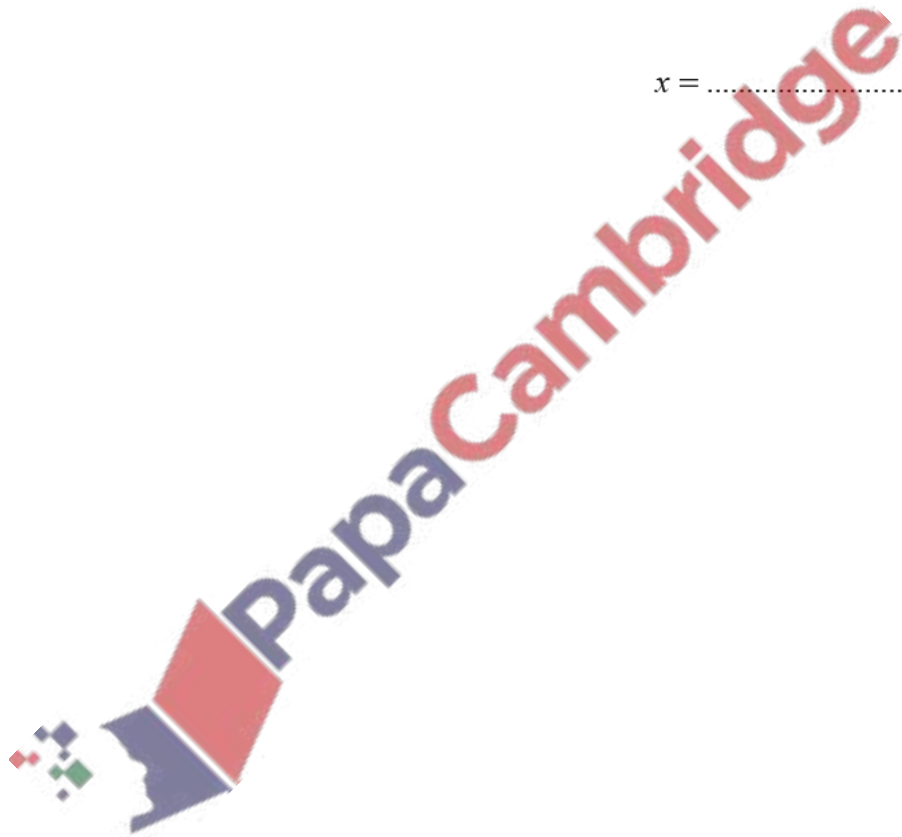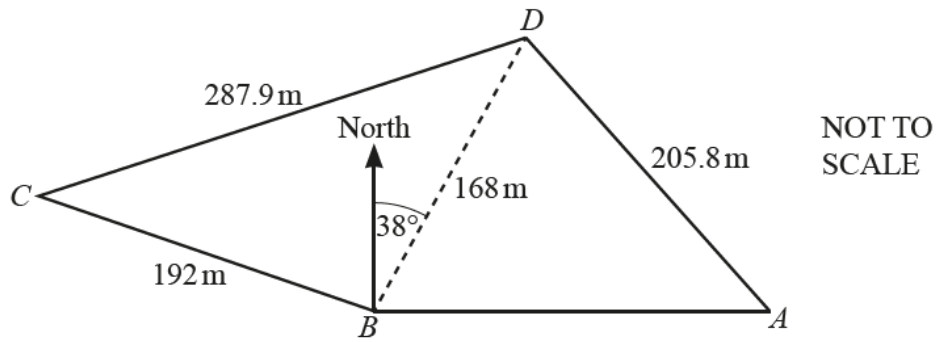
The diagram shows a field, $ABCD$, on horizontal ground.
$BC = 192\,m$, $CD = 287.9\,m$, $BD = 168\,m$ and $AD = 205.8\,m$.

(a) (i)   Calculate angle CBD and show that it rounds to 106.0°, correct to 1 decimal place.

[4]

(ii)   The bearing of D from B is 038°.

Find the bearing of C from B.

.... [1]

(iii) A is **due east** of B.

Calculate the bearing of D from A.

.... [5]

(b) (i) Calculate the area of triangle *BCD*.

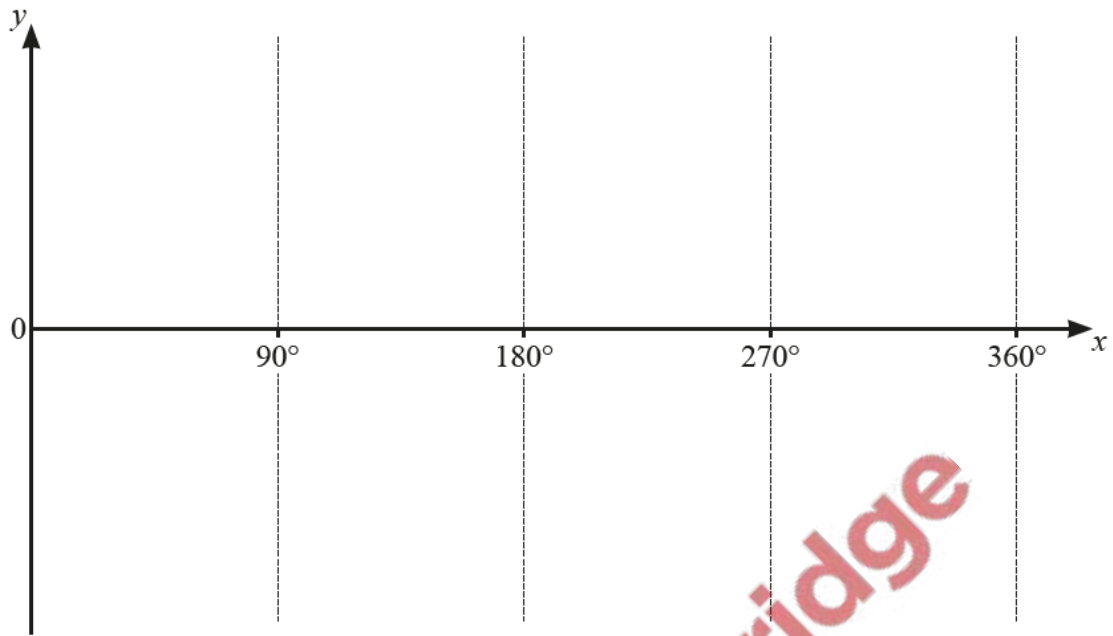... m² [2]

(ii) Tomas buys the triangular part of the field, *BCD*.
The cost is \$35 750 per hectare.

Calculate the amount he pays.
Give your answer correct to the nearest \$100.
[1 hectare = 10 000 m²]

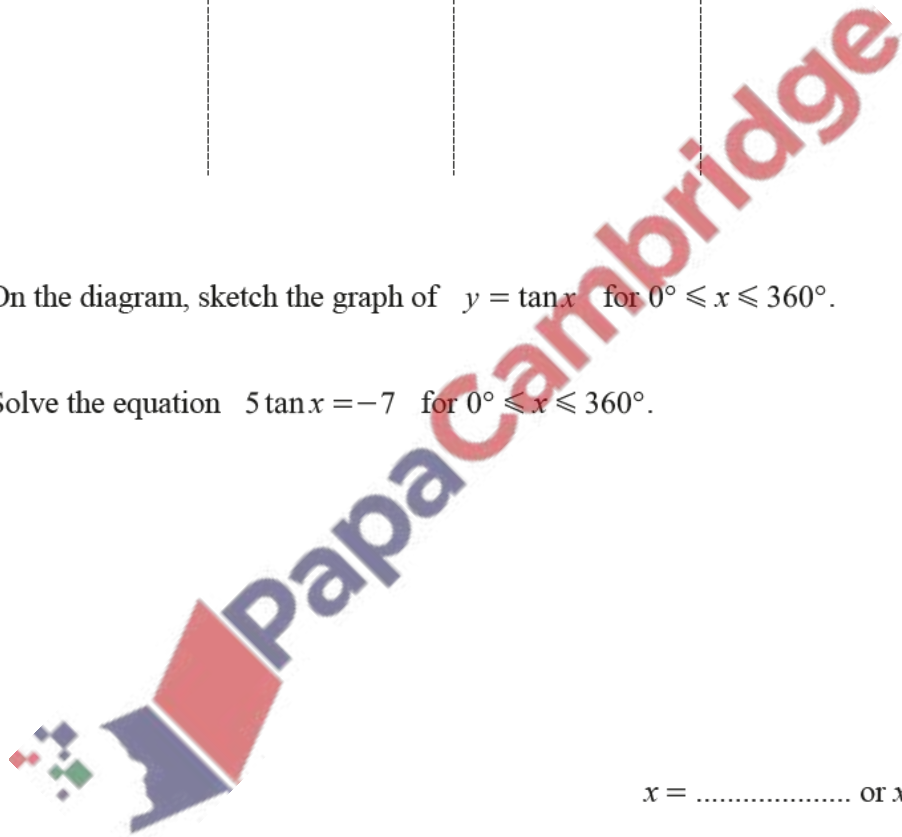\$ .... [2]
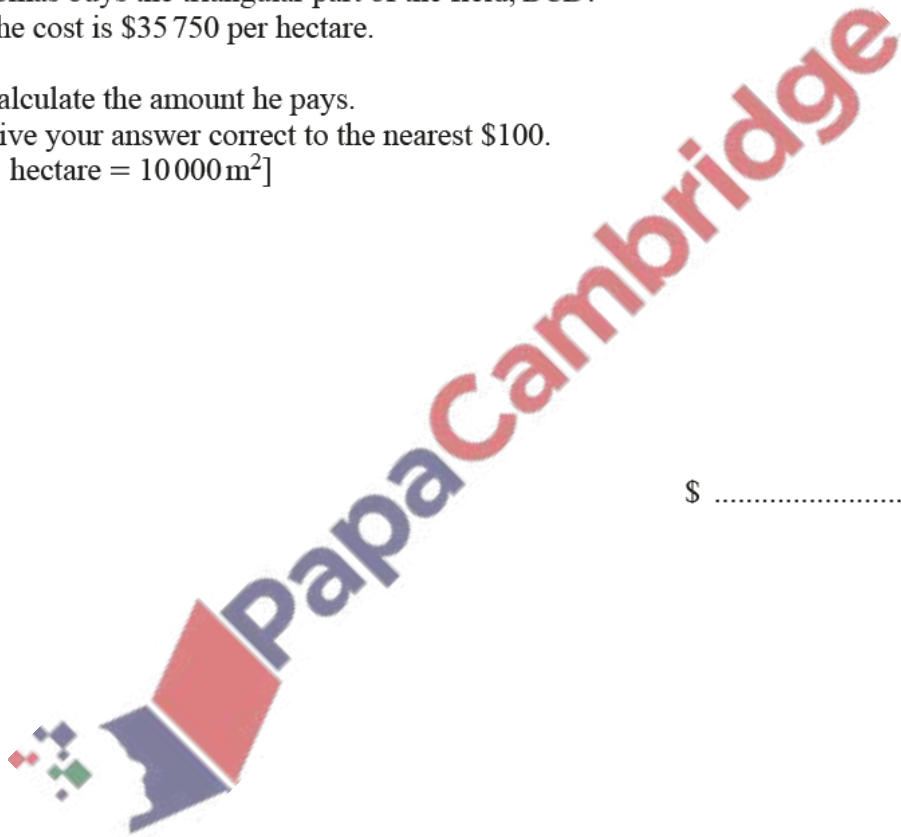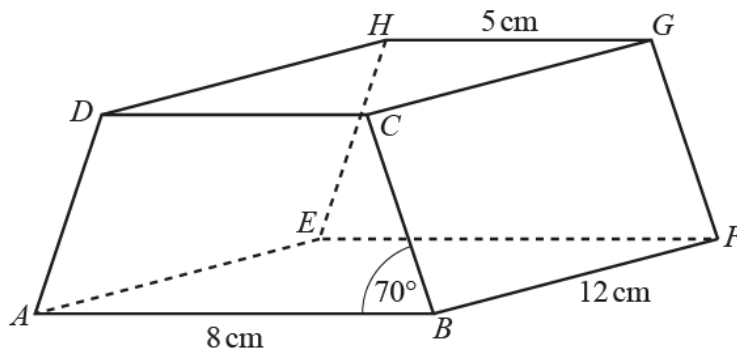
(b)

(i) On the diagram, sketch the graph of $y = \tan x$ for $0° \leqslant x \leqslant 360°$. [2]

(ii) Solve the equation $5 \tan x = -7$ for $0° \leqslant x \leqslant 360°$.

$x =$ .... or $x =$ .... [3]

NOT TO SCALE

The diagram shows a prism with a rectangular base, $ABFE$.
The cross-section, $ABCD$, is a trapezium with $AD = BC$.
$AB = 8\,cm$, $GH = 5\,cm$, $BF = 12\,cm$ and angle $ABC = 70°$.

(a) Calculate the total surface area of the prism.
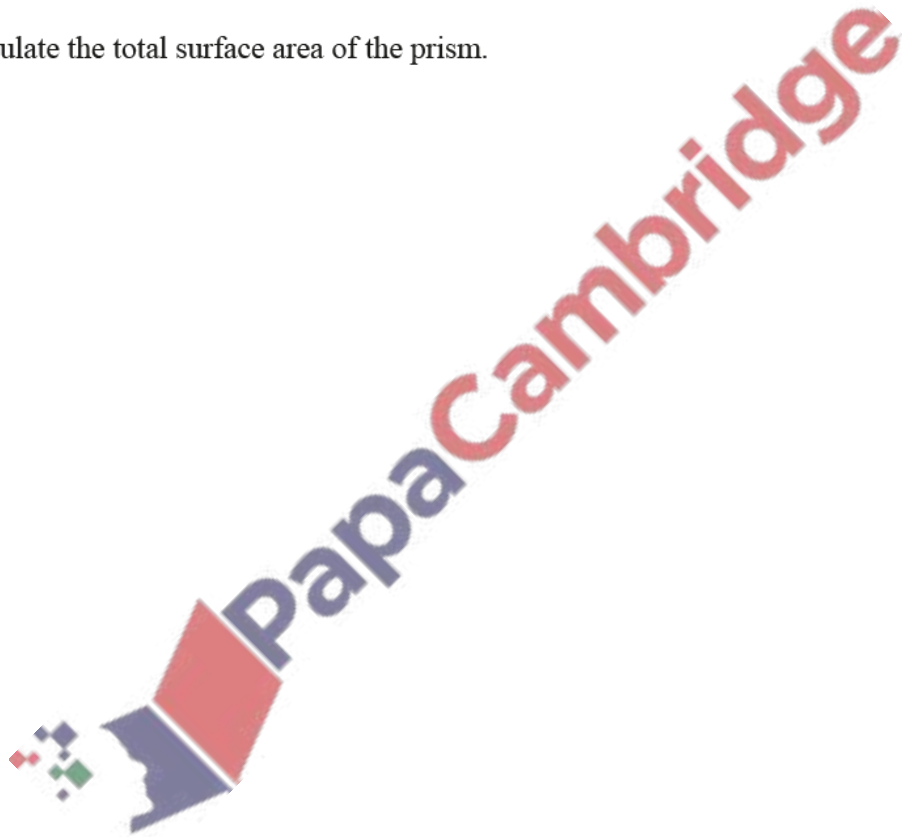
.... cm^2 [6]

(b) The perpendicular from G onto EF meets EF at X.

    (i) Show that $EX = 6.5\,\text{cm}$.

[1]

    (ii) Calculate AX.

$AX = $ .... cm [2]

    (iii) Calculate the angle between the diagonal AG and the base $ABFE$.

.... [2]

A

4.6 m

NOT TO
SCALE

37°

B

C
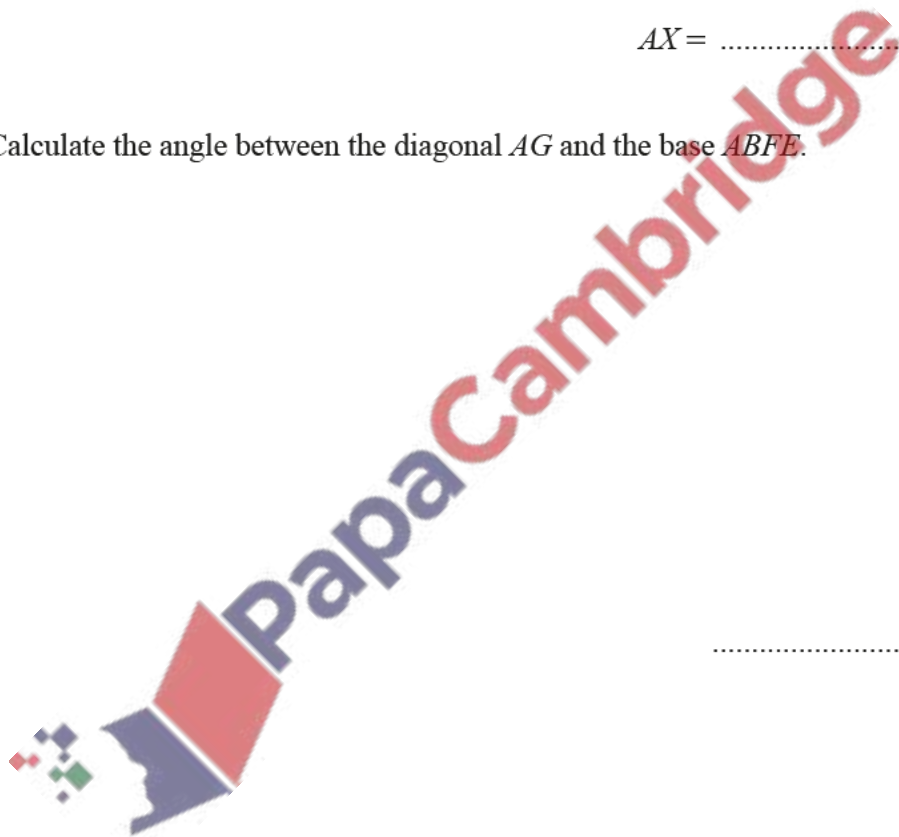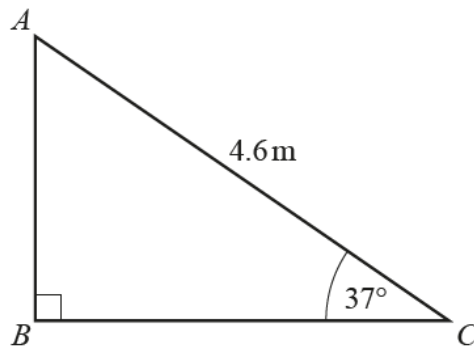
The diagram shows a right-angled triangle ABC.

Calculate AB.

$AB =$ .... m [2]

11. March/2020/Paper_42/No.8

(a)
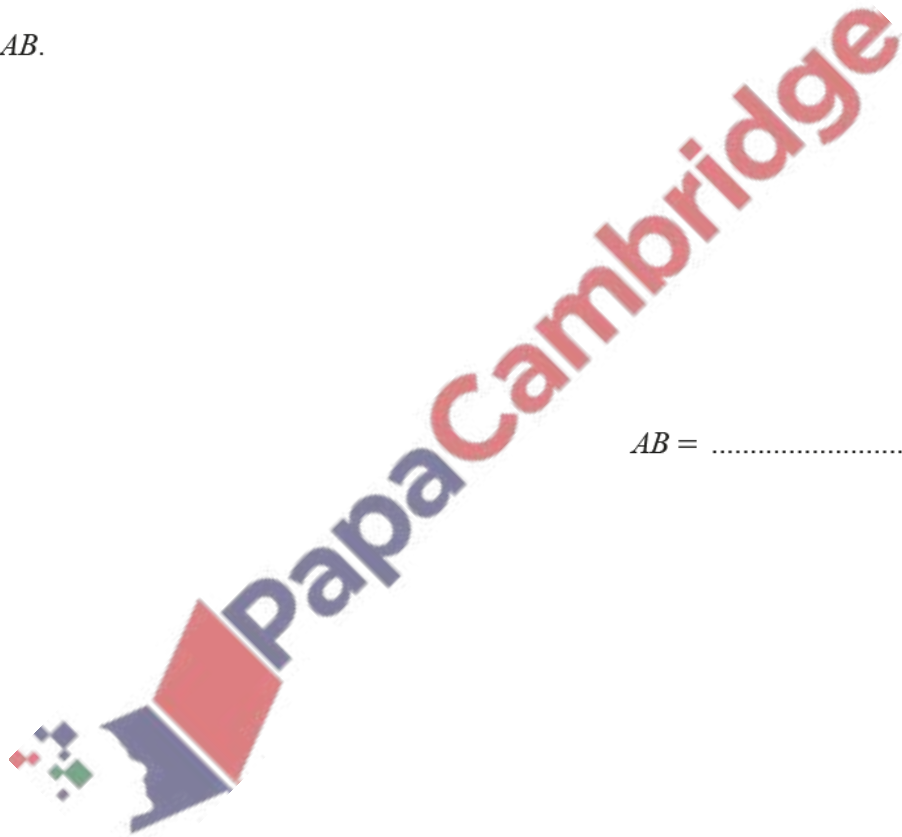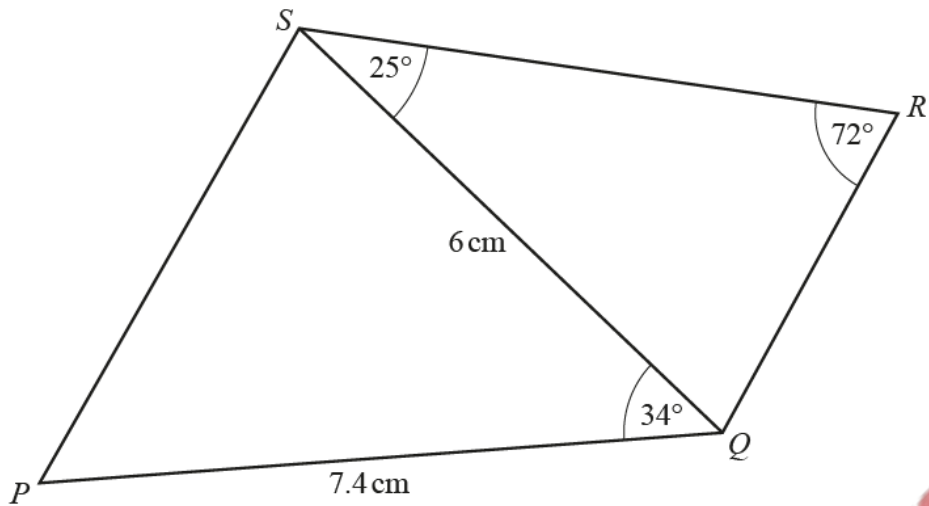
The diagram shows a quadrilateral $PQRS$ formed from two triangles, PQS and QRS.

Calculate

(i) QR,

$QR =$ .... cm [3]

(ii) PS,

$PS =$ .... cm [3]
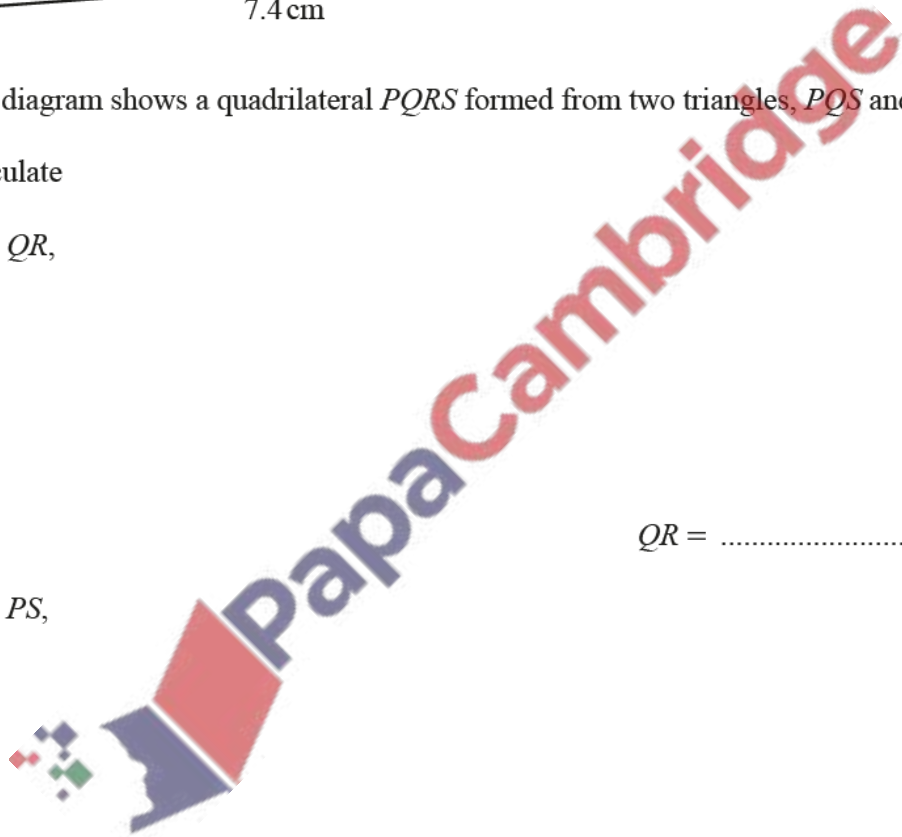
(iii) the area of quadrilateral *PQRS*.

.... cm^2 [4]

(b)
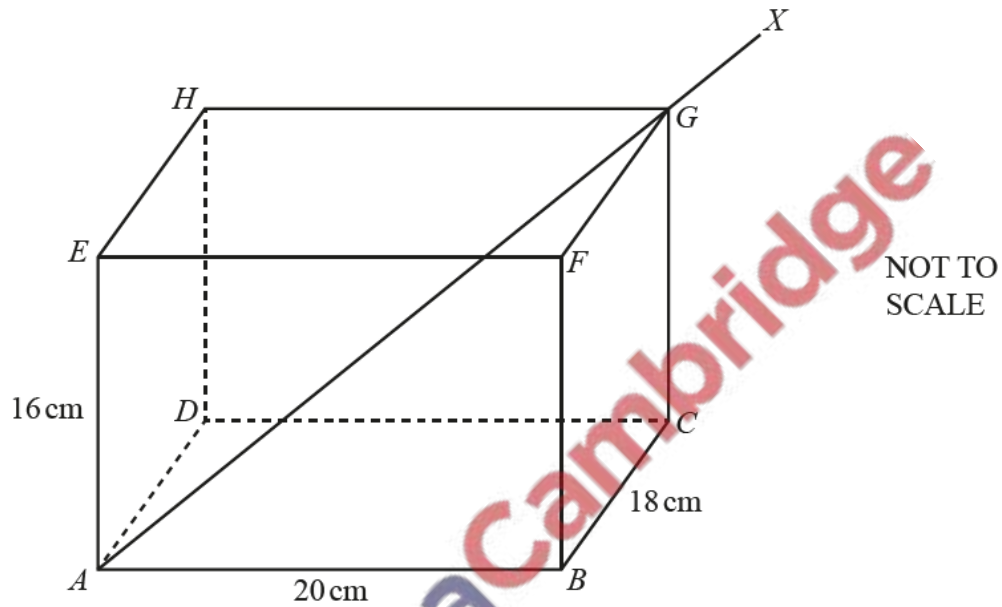
The diagram shows an open box *ABCDEFGH* in the shape of a cuboid.
AB = 20 cm, *BC* = 18 cm and *AE* = 16 cm.
A thin rod *AGX* rests partly in the box as shown.
The rod is 40 cm long.

(i) Calculate *GX*, the length of the rod which is outside the box.

GX = ... cm [4]

14

(ii) Calculate the angle the rod makes with the base of the box.

.... [3]
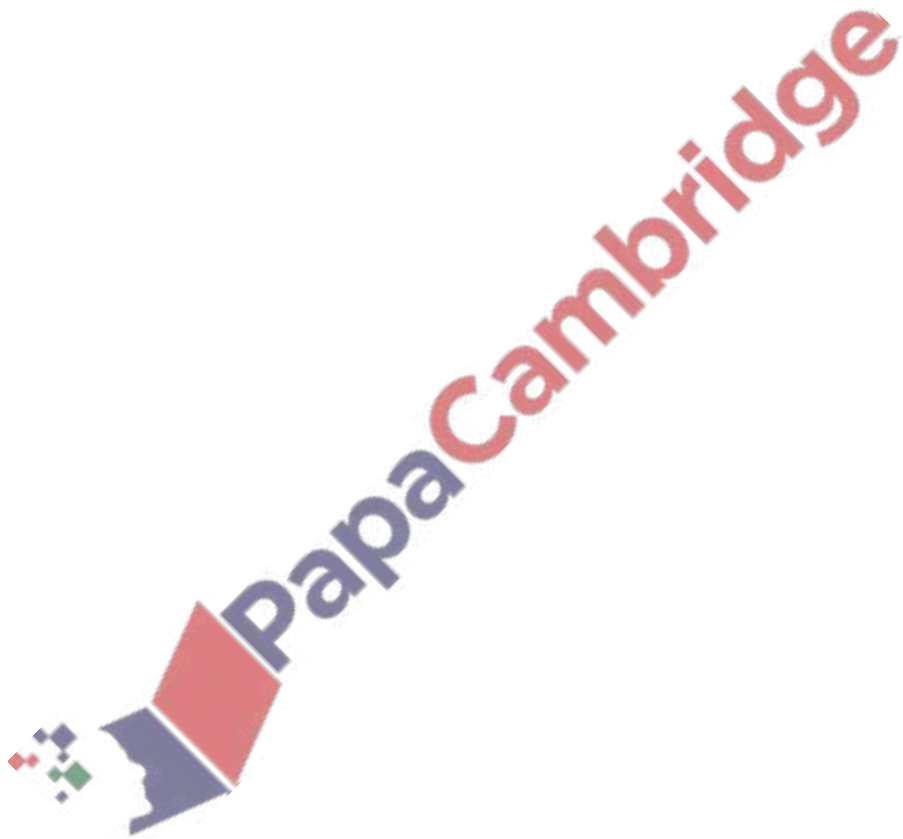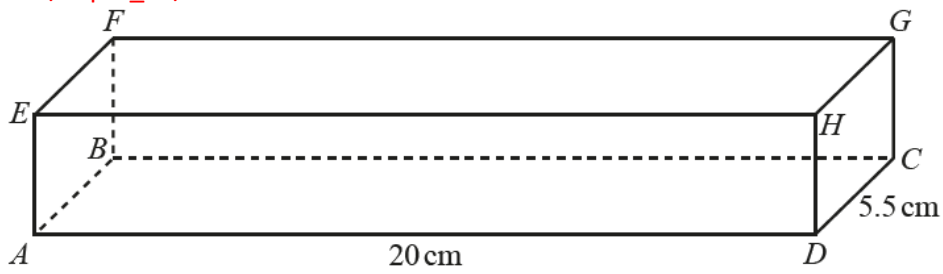
The diagram shows cuboid $ABCDEFGH$ of length $20\,cm$ and width $5.5\,cm$.
The volume of the cuboid is $495\,cm^3$.

Find the angle between the line AG and the base of the cuboid $ABCD$.
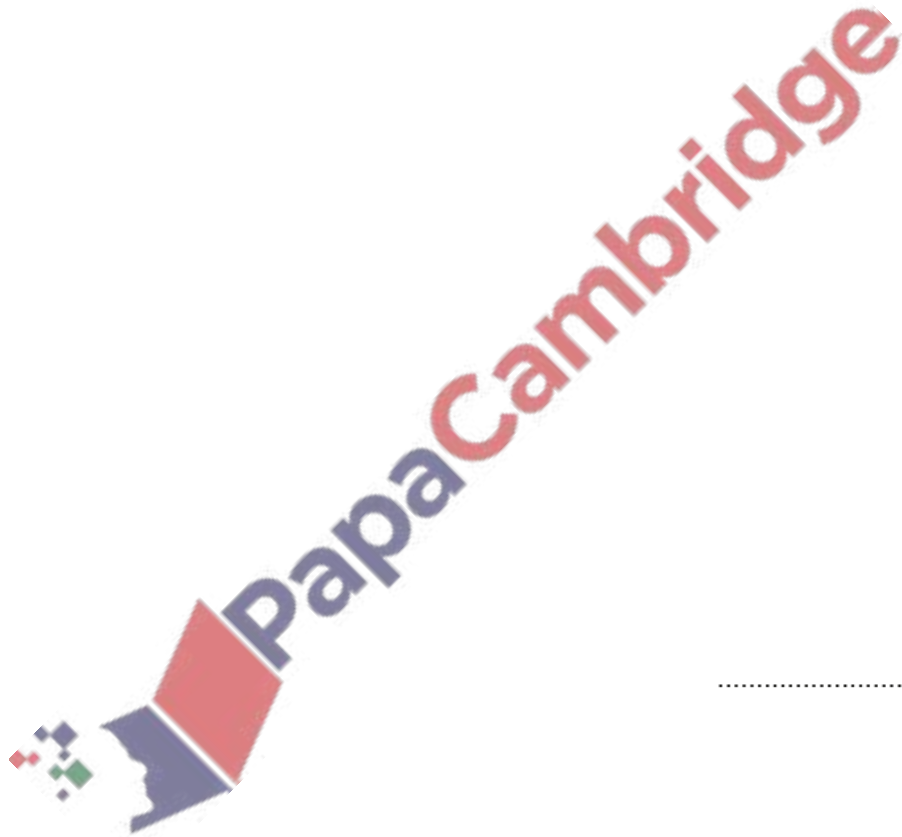
.... [5]
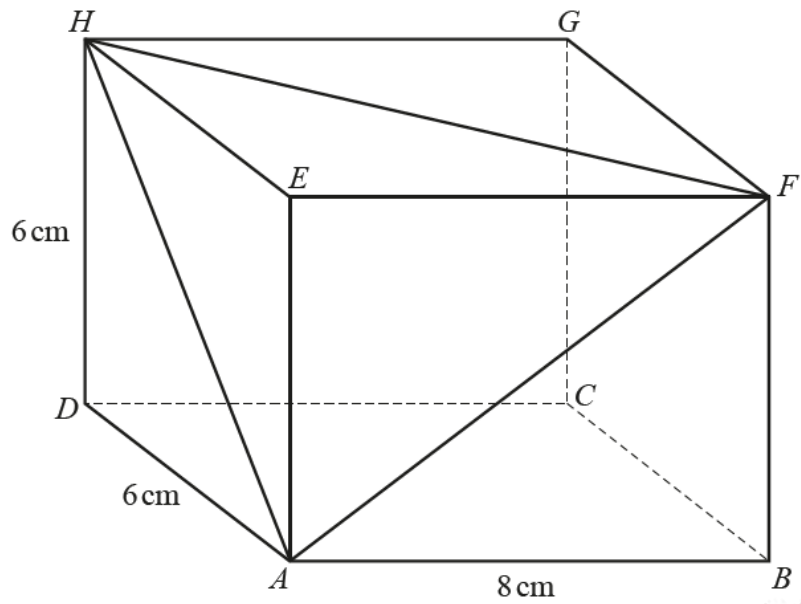
NOT TO SCALE

The diagram shows a cuboid.
$AB = 8\,\text{cm}$, $AD = 6\,\text{cm}$ and $DH = 6\,\text{cm}$.

Calculate angle HAF.
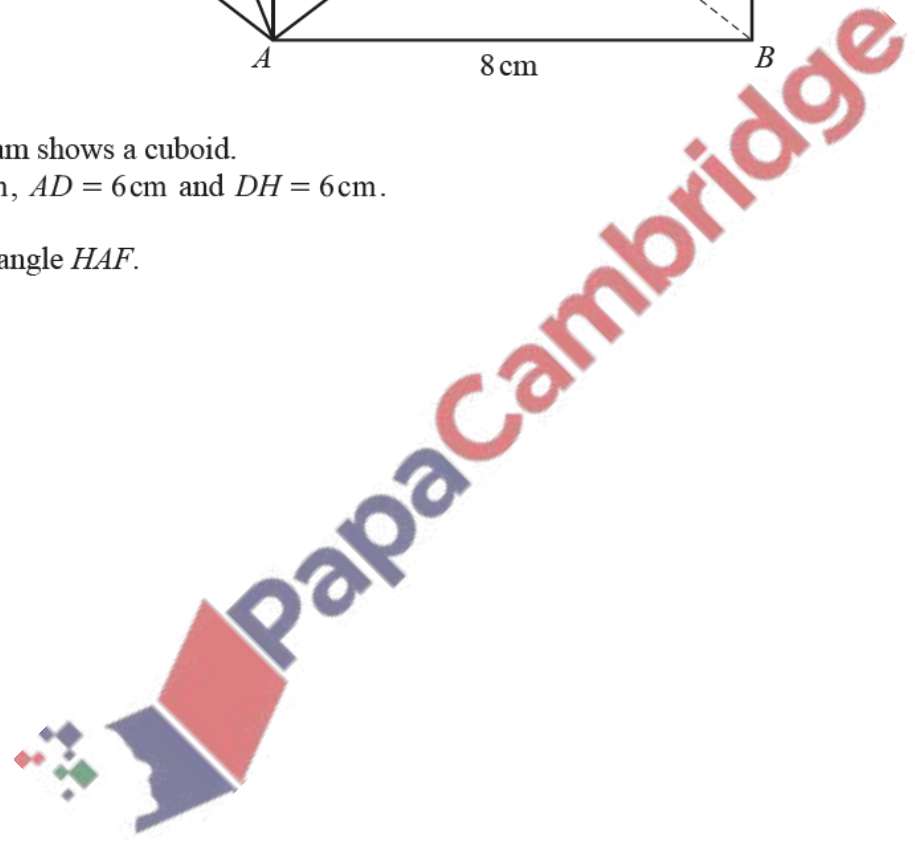
Angle $HAF = $ .... [6]
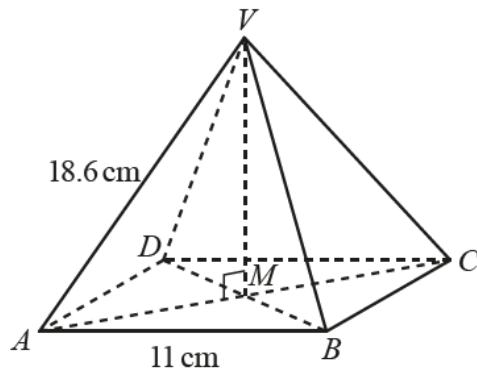
NOT TO SCALE

The diagram shows a pyramid with a square base $ABCD$.
The diagonals AC and BD intersect at M.
The vertex V is vertically above M.
$AB = 11$ cm and $AV = 18.6$ cm.

Calculate the angle that AV makes with the base.

.... [4]

(a) A speedboat travels at 84 kilometres per hour.

Change this speed into metres per minute.

.... m/min [2]

(b)

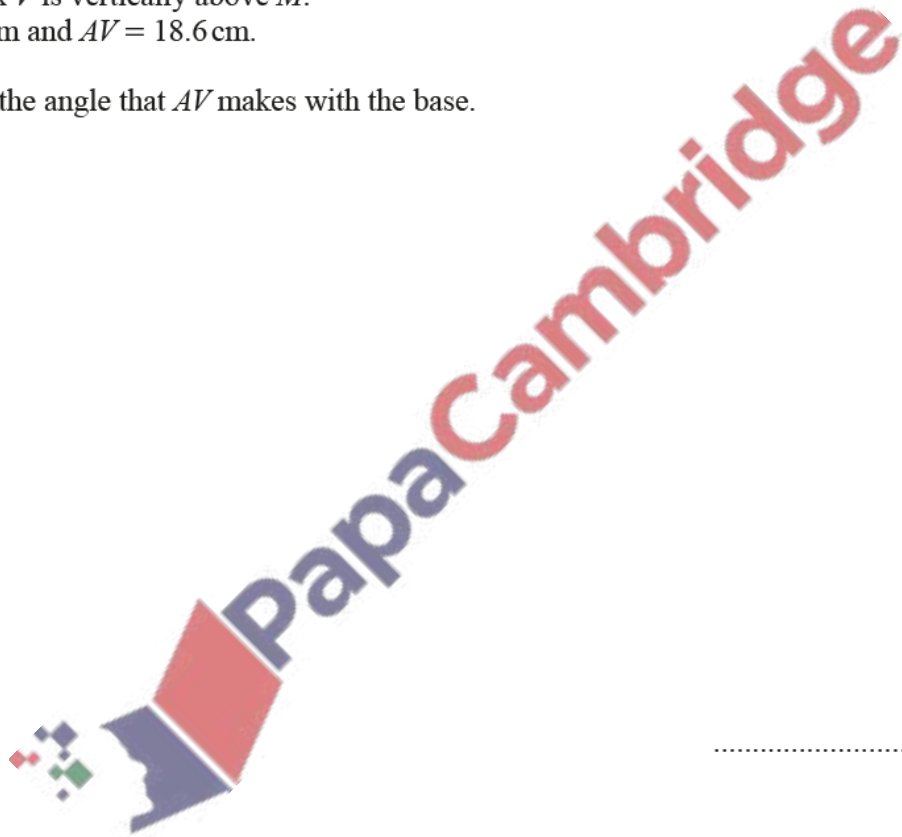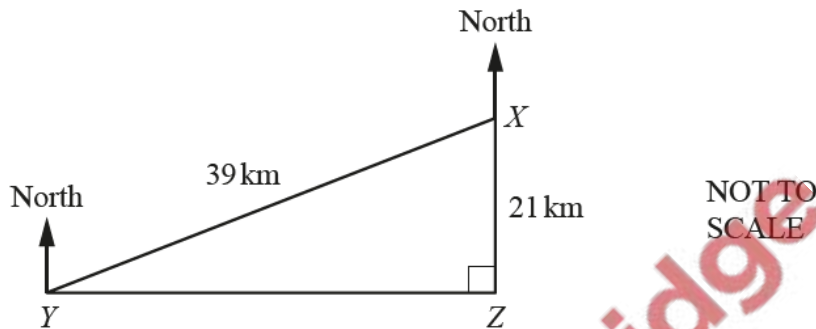The speedboat starts at X and travels to Y, then to Z and then back to X.
Z is due south of X and Y is due west of Z.
$XY = 39$ km and $XZ = 21$ km.

(i) Calculate YZ.

$YZ =$ .... km [3]

(ii) Calculate angle YXZ.

Angle $YXZ =$ .... [2]

(iii) Find the bearing of Y from X.

.... [1]

North

80 m

B

NOT TO
SCALE

A 72°

115 m

C
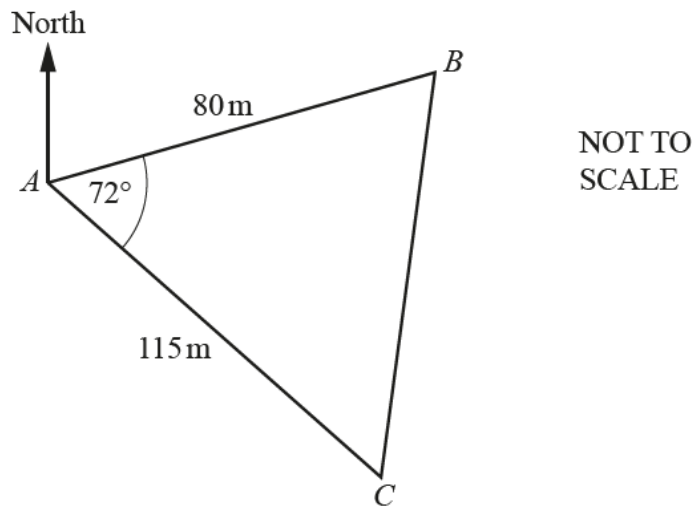
The diagram shows the positions of three points A, B and C in a field.

(a) Show that BC is 118.1 m, correct to 1 decimal place.

[3]

(b) Calculate angle ABC.

Angle $ABC =$ .... [3]

(c) The bearing of C from A is $147°$.

Find the bearing of

(i) A from B,

.... [3]

(ii) B from C.

.... [2]

(d) Mitchell takes 35 seconds to run from A to C.

Calculate his average running speed in kilometres per hour.

.... km/h [3]

(e) Calculate the shortest distance from point B to AC.

.... m [3]
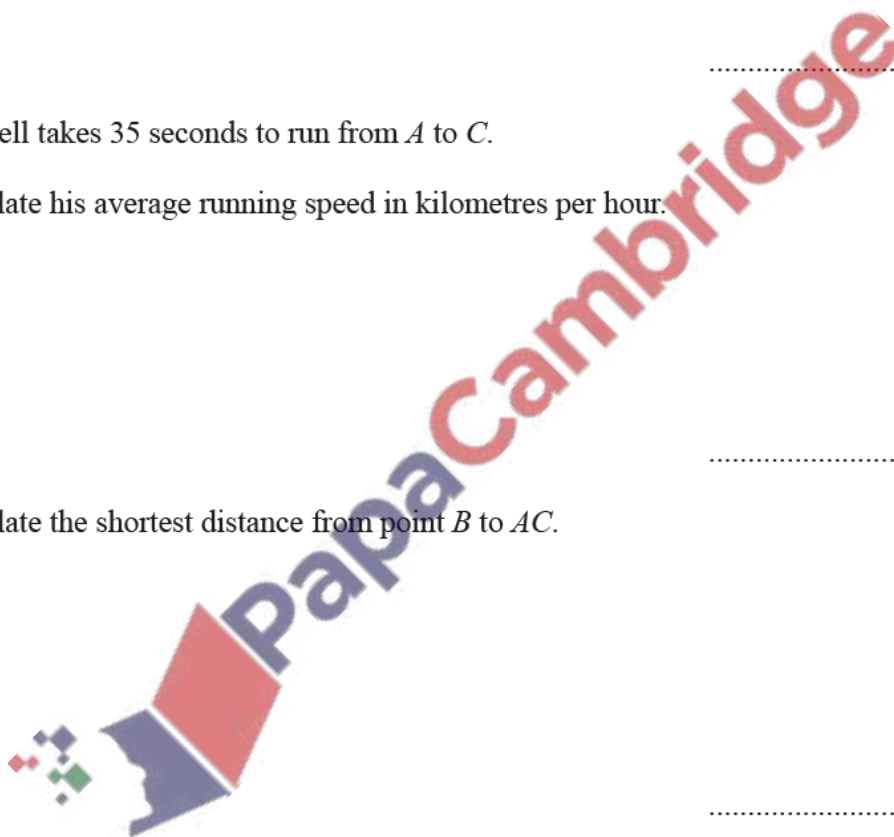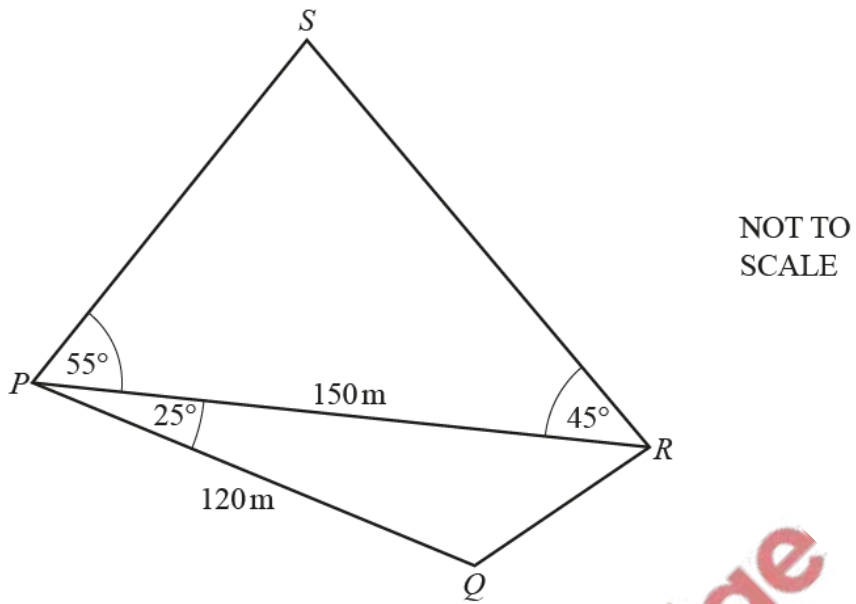
The diagram shows two triangles.

(a) Calculate QR.

$QR =$ .... m [3]

(b) Calculate RS.

$RS =$ .... m [4]

(c) Calculate the total area of the two triangles.
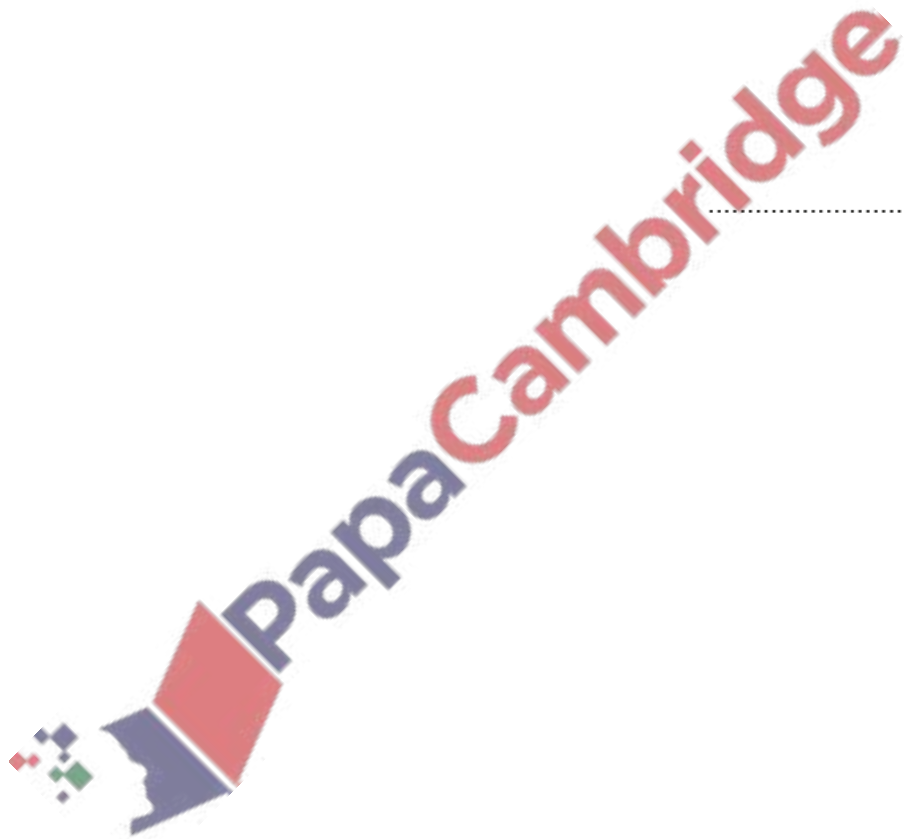
.... m^2 [3]

(a)
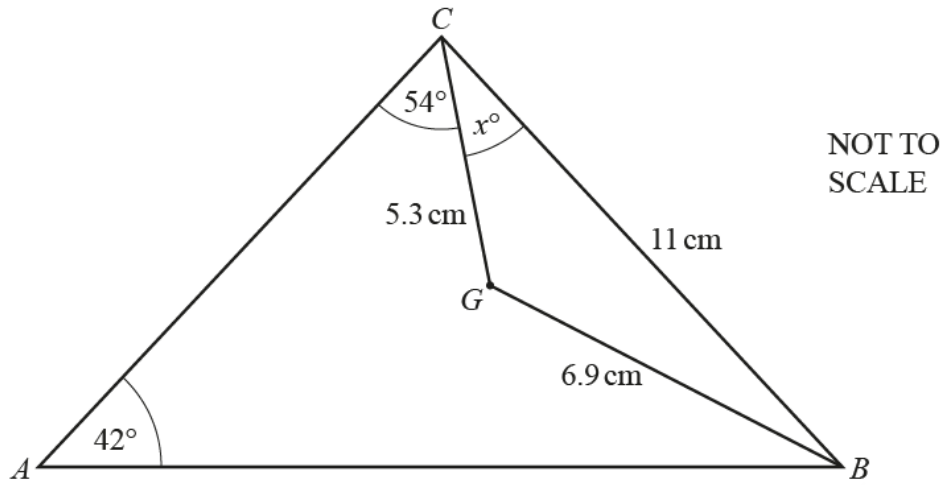
The diagram shows triangle ABC with point G inside.
$CB = 11\,\text{cm}$, $CG = 5.3\,\text{cm}$ and $BG = 6.9\,\text{cm}$.
Angle $CAB = 42°$ and angle $ACG = 54°$.

(i) Calculate the value of x.

$x =$ .... [4]

(ii) Calculate AC.

$AC =$ .... cm [4]

(b)
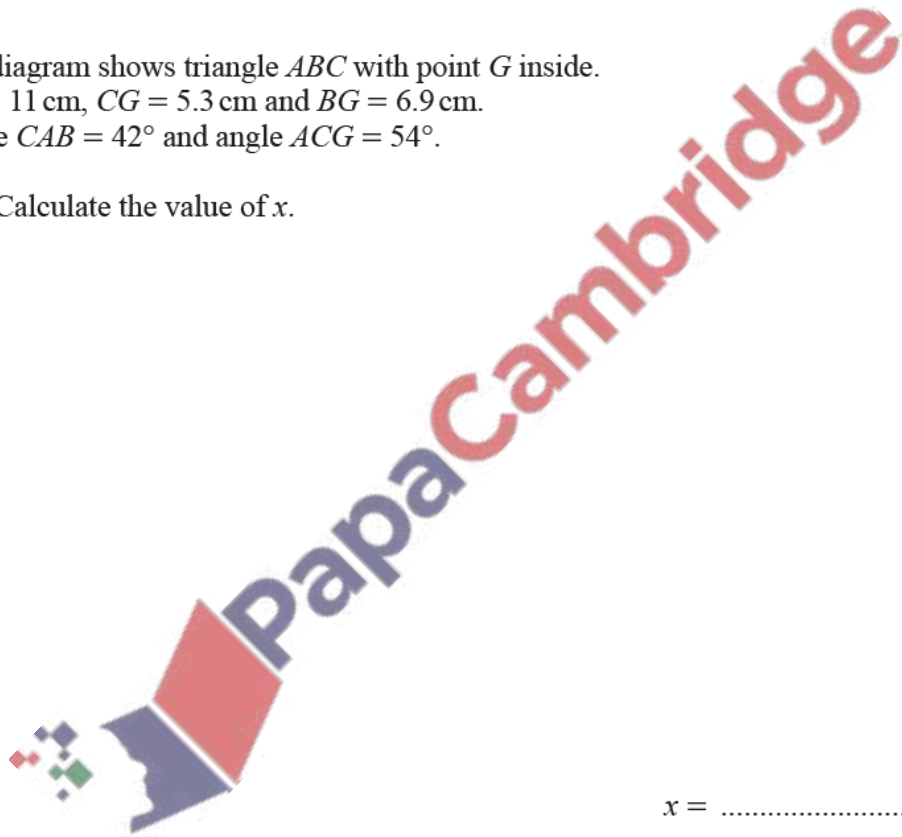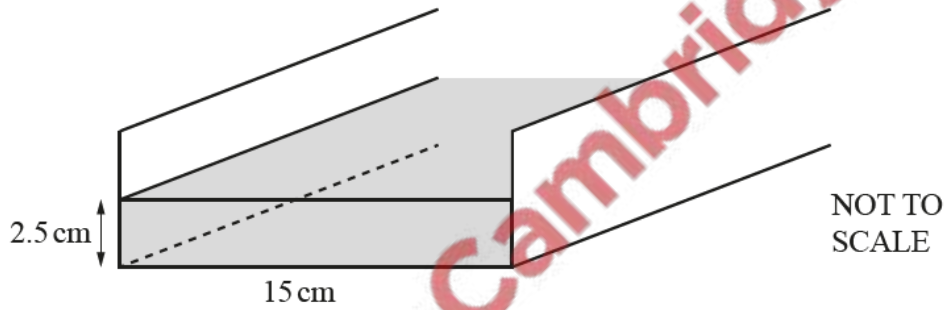
Water flows at a speed of 20 cm/s along a rectangular channel into a lake.
The width of the channel is 15 cm.
The depth of the water is 2.5 cm.

Calculate the amount of water that flows from the channel into the lake in 1 hour.
Give your answer in litres.

.... litres [4]