1 The diagram shows a right-angled triangle.
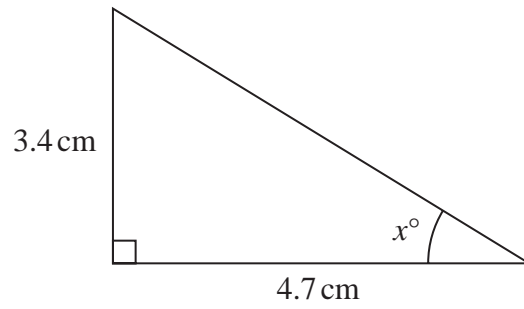
Diagram **NOT** accurately drawn

3.4 cm

$x°$

4.7 cm

Calculate the value of x.
Give your answer correct to one decimal place.

$$\tan x° = \frac{3.4 \text{ cm}}{4.7 \text{ cm}} \quad ①$$

$$x° = \tan^{-1} \frac{3.4}{4.7} \quad ①$$

$$= 35.9° \quad ①$$

$x =$ ....35.9...

(Total for Question 1 is 3 marks)

2 Here is a right-angled triangle.

P

Diagram **NOT**
accurately drawn

63°

24.3 cm

R

Q
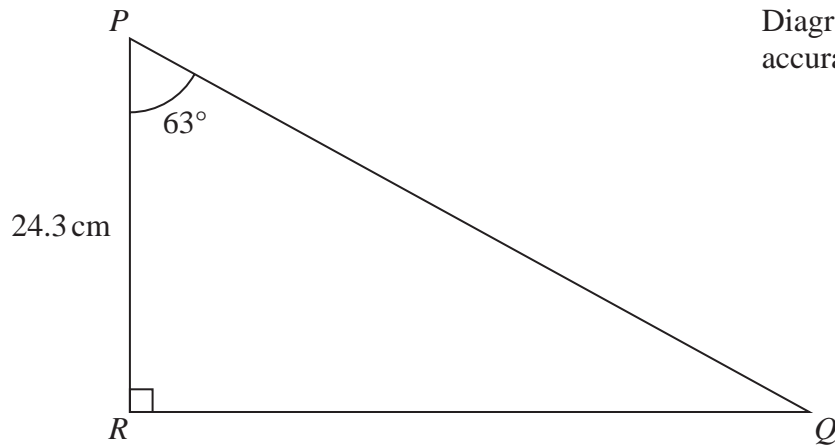
Calculate the length of *PQ*.
Give your answer correct to 3 significant figures.

$$\cos 63° = \frac{PR}{PQ}$$

$$\cos 63° = \frac{24.3}{PQ} \quad \textcircled{1}$$

$$PQ = \frac{24.3}{\cos 63°} \quad \textcircled{1}$$

$$= 53.5 \text{ cm} \quad \textcircled{1}$$

53.5
.... cm

(Total for Question 2 is 3 marks)
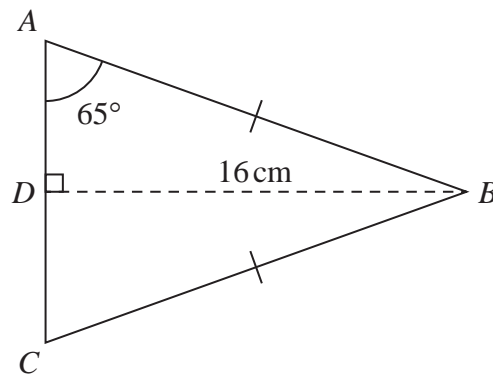
3 Here is isosceles triangle *ABC*.

A
65°
16 cm
D
B
C

Diagram **NOT**
accurately drawn

D is the midpoint of *AC* and *DB* = 16 cm.

Angle *DAB* = 65°

Work out the perimeter of triangle *ABC*.
Give your answer correct to one decimal place.

$$AD = \frac{16}{\tan 65°} \quad ①$$

$$= 7.4609 \ldots \text{cm}$$

$$AB = \frac{16}{\sin 65°}$$

$$= 17.654 \ldots \text{cm} \quad ①$$

$$\text{Perimeter} = 2(17.654\ldots) + 2(7.4609\ldots) \quad ①$$

$$= 50.2 \text{ cm} (1dp) \quad ①$$

50.2 .... cm

(Total for Question 3 is 4 marks)

4 The diagram shows triangle *ABP* inside the regular hexagon *ABCDEF*
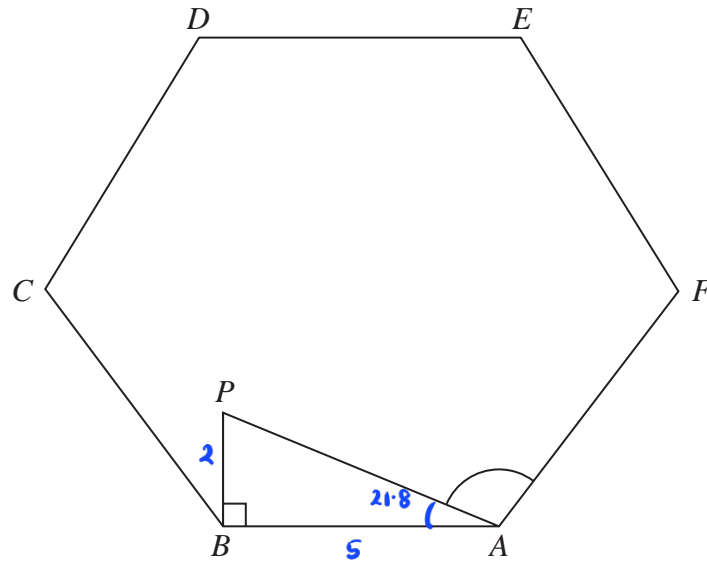
Diagram **NOT** accurately drawn

AB = 5 cm   *BP* = 2 cm   Angle *ABP* = 90°

Work out the size of angle *PAF*

Give your answer correct to 3 significant figures.

Internal angle of hexagon $= \dfrac{6-2}{6} \times 180°$

$$= \dfrac{4}{6} \times 180°$$

$$= 120° \quad ①$$

$\tan BAP = \dfrac{2}{5} \quad ①$

$BAP = \tan^{-1} \dfrac{2}{5} \quad ①$

$$= 21.8°$$

angle $PAF = 120° - 21.8° \quad ①$

$$= 98.2° \quad ①$$

98.2 °

(Total for Question 4 is 5 marks)

5 The diagram shows triangle *PQR*.

P

42°   9.5 cm

x cm

Q   R
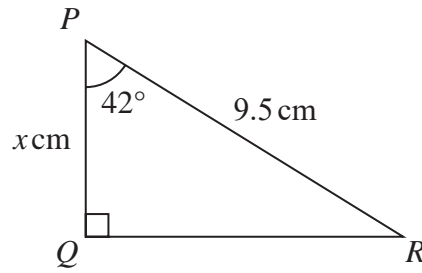
Diagram **NOT**
accurately drawn

Work out the value of *x*
Give your answer correct to one decimal place.

$$\cos 42° = \frac{x}{9.5}$$ ①

$$x = 9.5 \cos 42°$$ ①

$$= 7.1$$ ①

$x =$ ....7.1........

(Total for Question 5 is 3 marks)

6 *R* and *T* are points on a circle, centre *O*
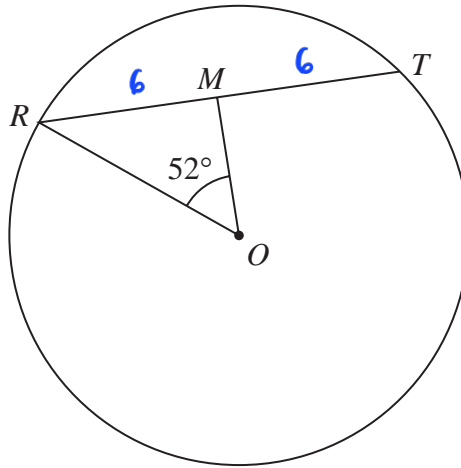
Diagram **NOT** accurately drawn

RT = 12 cm

M is the midpoint of *RT*

Angle *ROM* = 52°

Work out the area of the circle.

Give your answer correct to 3 significant figures.

$$\sin 52° = \frac{6}{r} \quad ①$$

$$r = \frac{6}{\sin 52°} \quad ①$$

$$= 7\cdot614$$

$$\text{Area} = \pi \times 7\cdot614^2 \quad ①$$

$$= 182 \quad ①$$

182 .... cm²

(Total for Question 6 is 4 marks)

7 The diagram shows a rectangular sheet of metal *ABCD*

A _____ B

50 cm

Diagram **NOT**
accurately drawn

26·4959...

32°

D _____ C

42·4024...
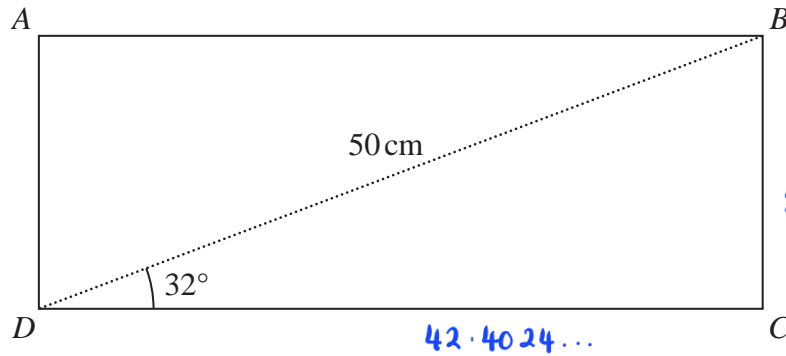
BD = 50 cm and angle *BDC* = 32°

Nasser joins side *AD* to side *BC* to form a cylinder.

BC is the height of the cylinder.
DC is the circumference of the cross section of the cylinder.

Work out the volume, in cm³, of the cylinder.
Give your answer correct to 3 significant figures.

$$\sin 32° = \frac{BC}{50}$$ ①

$$BC = 50 \sin 32° = 26·4959...$$ ①

$$\cos 32° = \frac{CD}{50}$$ ①

$$CD = 50 \cos 32° = 42·4024...$$

$$42·4024.. = 2\pi r$$

$$r = \frac{42·4024...}{2\pi} = 6·74855...$$ ①

$$Volume = \pi \times 6·74855...^2 \times 26·4959...$$ ①

$$= 3790$$ ①

3790

.... cm^3

(Total for Question 7 is 6 marks)

8 The diagram shows right-angled triangle *ABD*

Diagram **NOT** accurately drawn

B

14 cm

C

38°

) 17.15°

A

8 cm

D
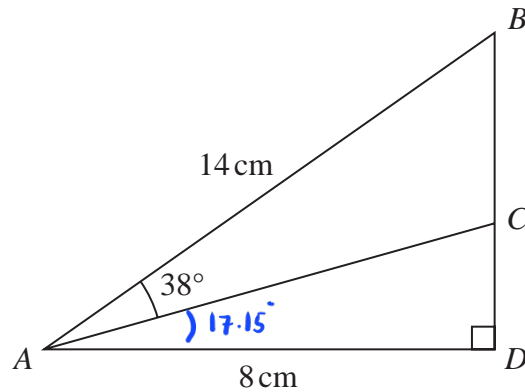
AB = 14 cm   *AD* = 8 cm

C is the point on *BD* such that angle *BAC* = 38°

Work out the length of *CD*
Give your answer correct to 3 significant figures.

$\cos BAD = \dfrac{8}{14}$ ①

$BAD = \cos^{-1}\dfrac{8}{14} = 55.15°....$ ①

$CAD = 55.15° - 38 = 17.15°$

$\tan 17.15 = \dfrac{CD}{8}$ ①

$CD = 8 \tan 17.15$

$= 2.47$ ①

.... **2.47** .... cm

(Total for Question 8 is 4 marks)