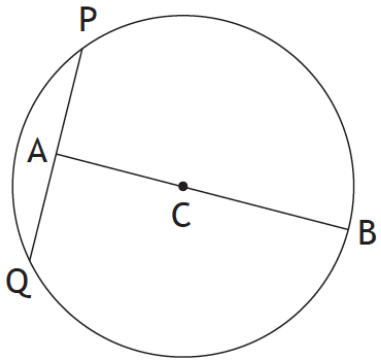
National 5 Mathematics

Properties of Shapes - Questions

Marks are indicated in brackets after each question number

2014 Paper 1 Question 12, (4)

The diagram below shows a circle, centre C.



The radius of the circle is 15 centimetres.

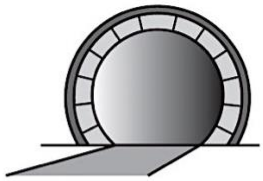
A is the mid-point of chord PQ.

The length of AB is 27 centimetres.

Calculate the length of PQ.

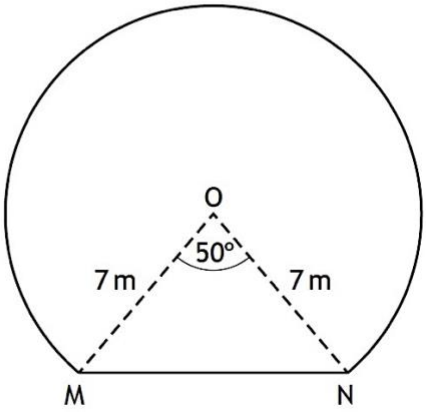
2014 Paper 2 Question 13, (5)

The picture shows the entrance to a tunnel which is in the shape of part of a circle.



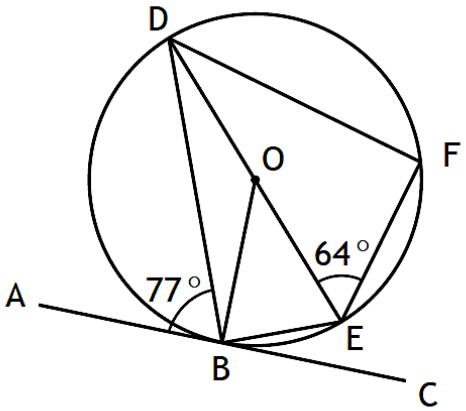
The diagram below represents the cross-section of the tunnel.

- The centre of the circle is O.
- MN is a chord of the circle.
- Angle MON is 50°.
- The radius of the circle is 7 metres.



Calculate the area of the cross-section of the tunnel.

2015 Paper 1 Question 3, (3)



AC is a tangent to the circle, centre O, with point of contact B.

DE is a diameter of the circle and F is a point on the circumference.

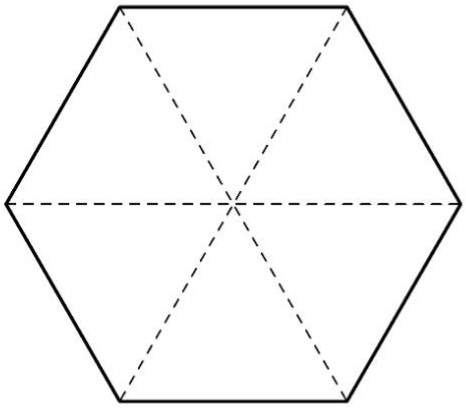
Angle ABD is 77° and angle DEF is 64°.

Calculate the size of angle BDF.

2015 Paper 2 Question 11, (4)

The top of a table is in the shape of a regular hexagon.

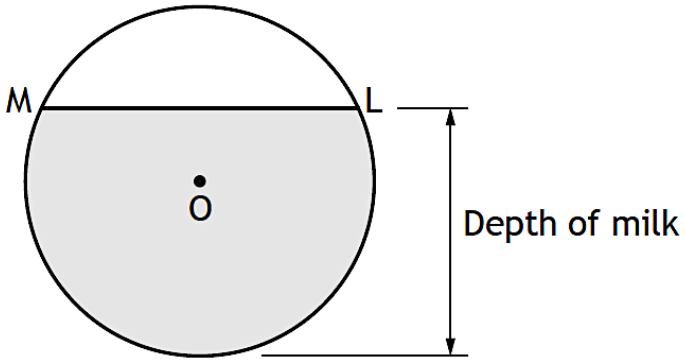
The three diagonals of the hexagon which are shown as dotted lines in the diagram below each have length 40 centimetres.



Calculate the area of the top of the table.

2015 Paper 2 Question 12, (4)

The diagram below shows the circular cross-section of a milk tank.



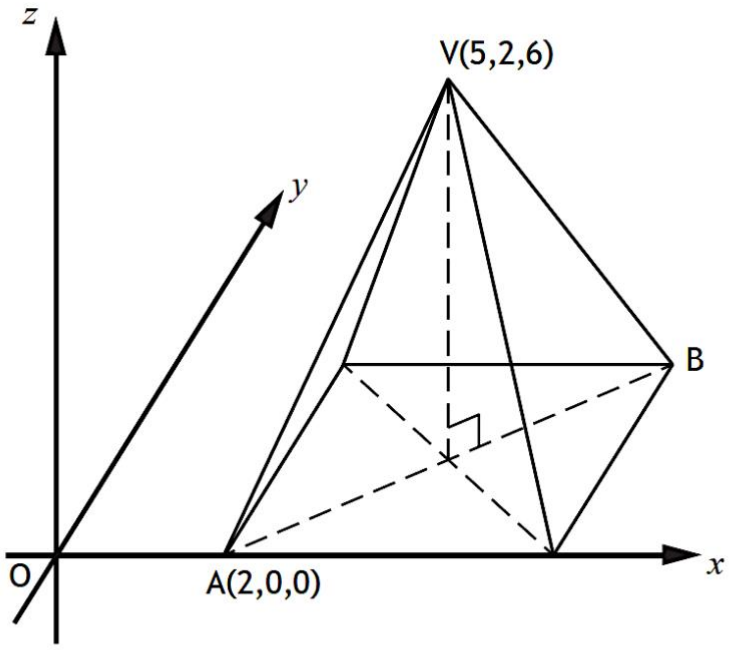
The radius of the circle, centre O, is 1·2 metres.

The width of the surface of the milk in the tank, represented by ML in the diagram, is 1·8 metres.

Calculate the depth of the milk in the tank.

2016 Paper 1 Question 7, (1) (3)

The diagram shows a rectangular based pyramid, relative to the coordinate axes.



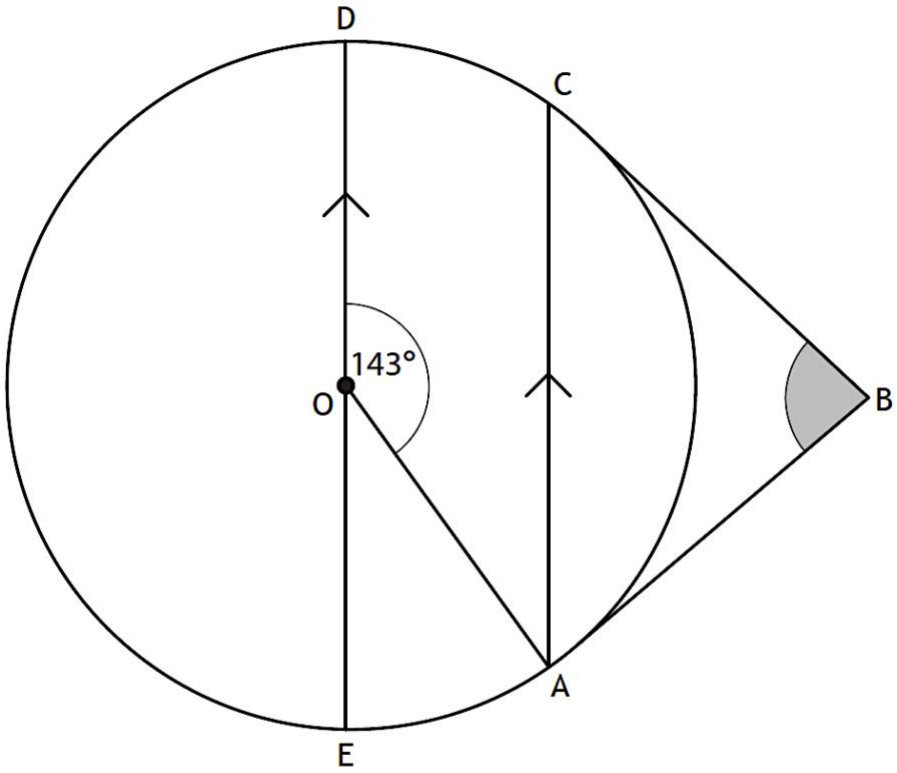
- A is the point (2,0,0).
- V is the point (5,2,6).

(a) Write down the coordinates of B.

(b) Calculate the length of edge AV of the pyramid.

2016 Paper 2 Question 5, (3)

The diagram below shows a circle, centre O.

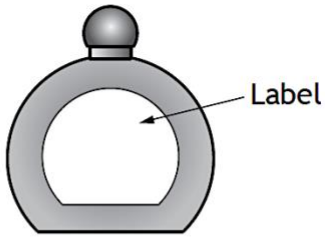


- AB and CB are tangents to the circle.
- AC and ED are parallel.
- Angle AOD is 143°.

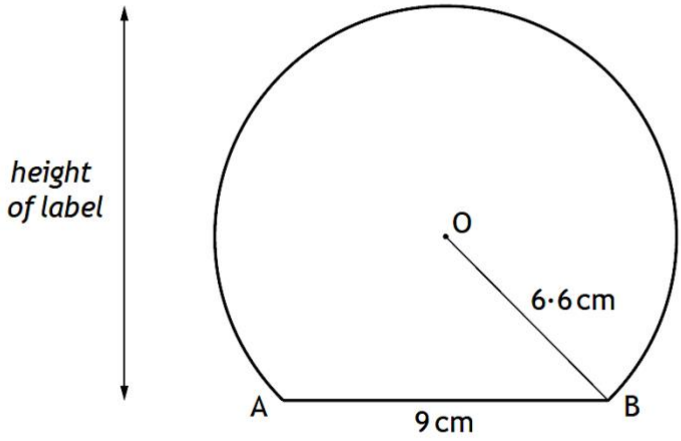
Calculate the size of angle ABC.

2016 Paper 2 Question 15, (4)

This perfume bottle has a label in the shape of part of a circle.



A diagram of the label is shown below.



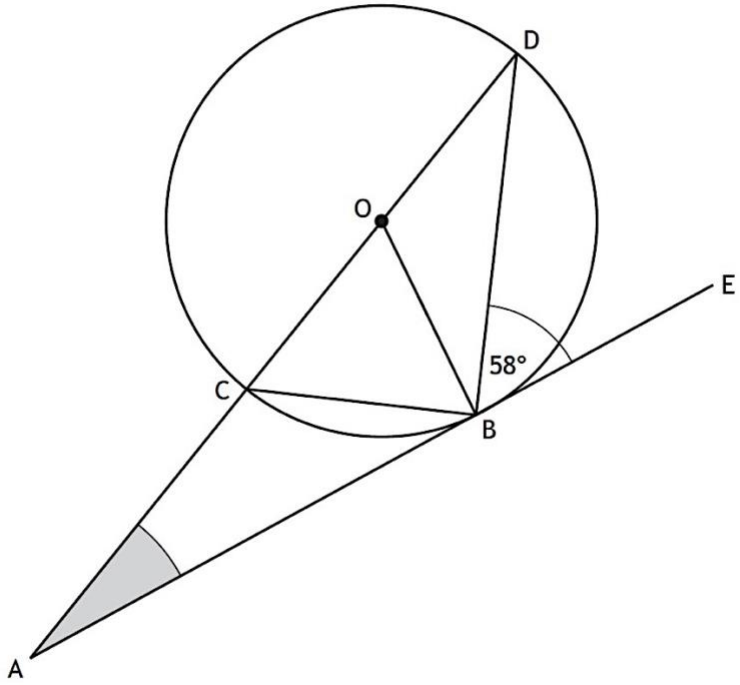
- The centre of the circle is O.
- The chord AB is 9 centimetres.
- The radius OB is 6·6 centimetres.

Find the height of the label.

2017 Paper 1 Question 9, (3)

In the diagram shown below:

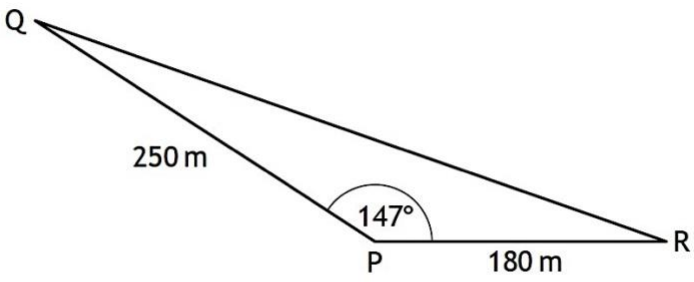
- ABE is a tangent to the circle centre O
- Angle DBE is 58°



Calculate the size of angle CAB.

2017 Paper 2 Question 3, (3)

A piece of land is in the shape of a triangle as shown.



- PQ = 250 metres
- PR = 180 metres
- angle QPR = 147°

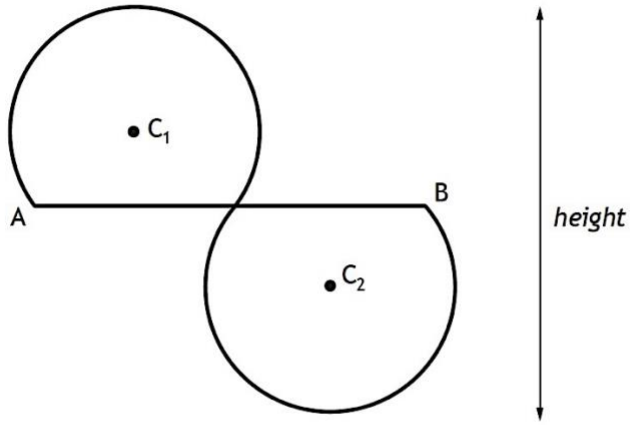
The owner wishes to build a fence along the side QR.

Calculate the length of the fence.

2017 Paper 2 Question 13, (4)

Two identical shapes are used to form a logo.

Each shape is part of a circle.



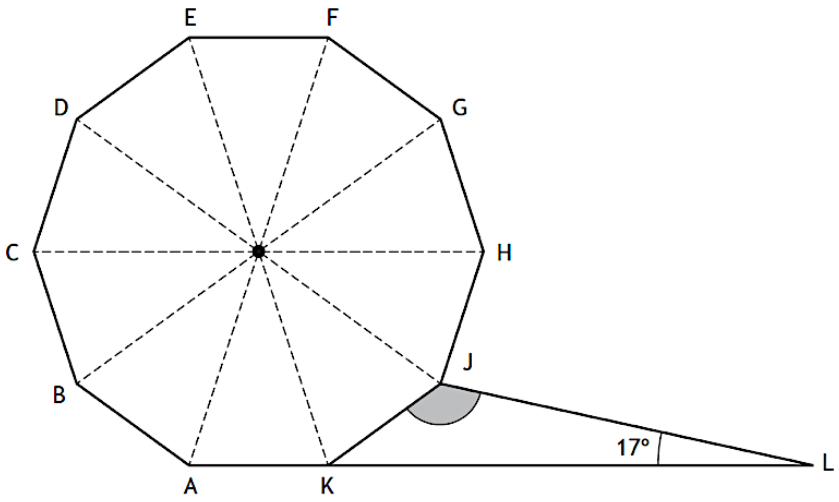
- The circles have centres C_1 and C_2.
- The radius of each circle is 14 centimetres.
- The logo has half-turn symmetry about the mid-point of AB.
- AB is 48 centimetres long.

Calculate the height of the logo.

2018 Paper 1 Question 9, (3)

In the diagram shown below, ABCDEFGHJK is a regular decagon.

- Angle KLJ is 17°.
- AKL is a straight line.



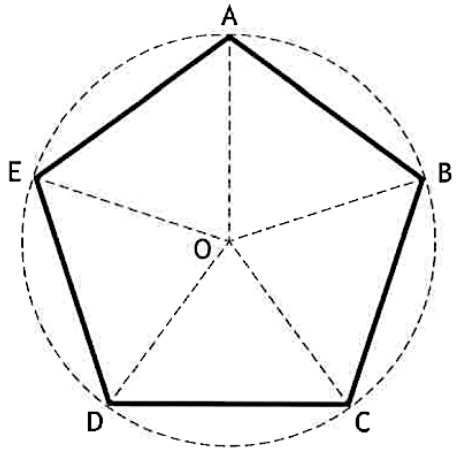
Calculate the size of shaded angle KJL.

2019 Paper 1 Question 11, (3)

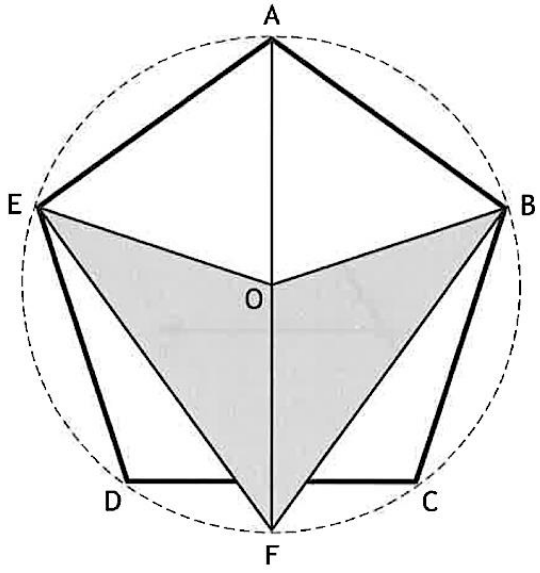
Pam is designing a company logo.

She starts by drawing a regular pentagon ABCDE.

The vertices of the pentagon lie on the circumference of a circle with centre O.



She then adds to the design as shown in the diagram below.



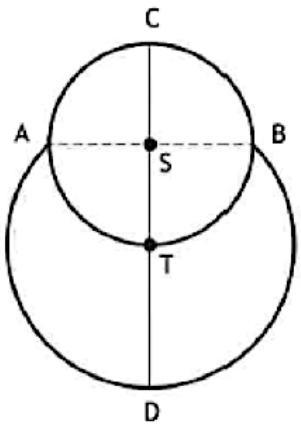
AF is a diameter of the circle.

Calculate the size of angle OFB.

2019 Paper 2 Question 18, (4)

The picture shows a cartoon snowman.

The diagram below represents the snowman.

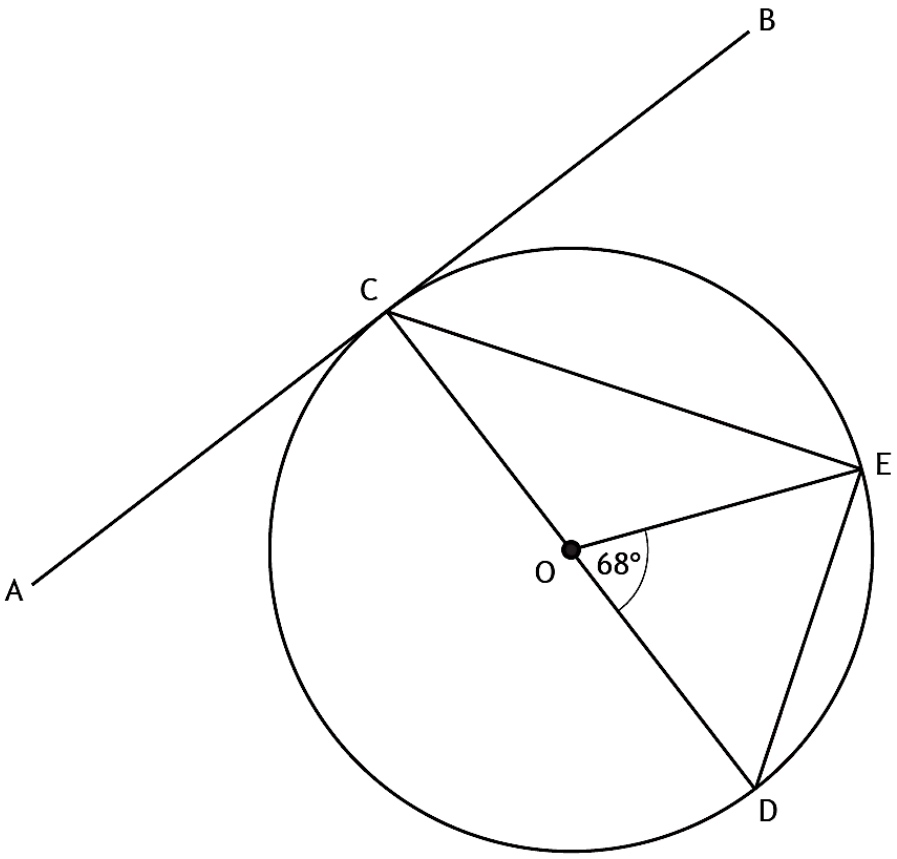


- The head is a small circle, centre S, with diameter 15 centimetres
- The body is part of a larger circle, centre T
- The point T lies on the circumference of the small circle
- The points A and B lie on the circumferences of both circles

Calculate CD, the height of the snowman.

2022 Paper 1 Question 4, (3)

The diagram below shows a circle with centre O.



AB is a tangent to the circle at the point C.

CD is a diameter of the circle.

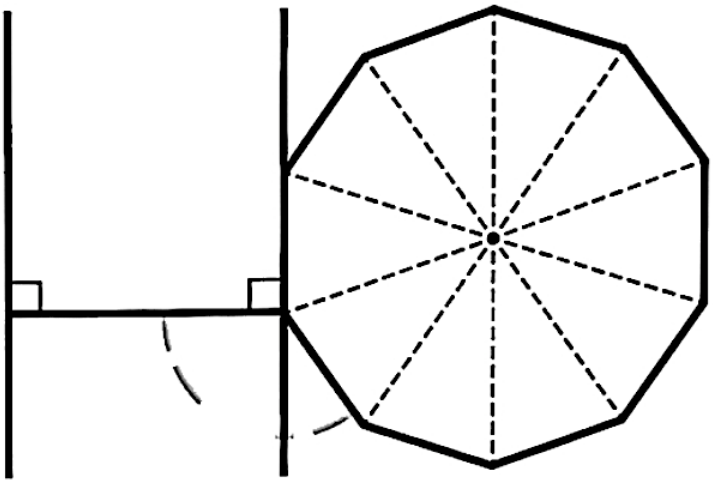
Angle EOD is 68°.

Calculate the size of angle ACE.

2023 Paper 2 Question 5, (2)

A logo consists of an H shape and a regular decagon.

The diagram represents the logo.



Calculate the size of the shaded angle.