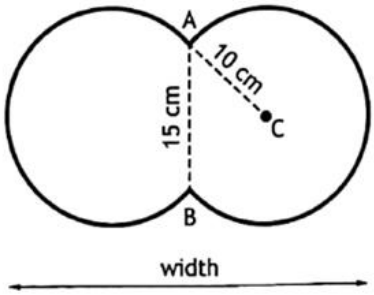
SQA Past paper questions

2024 - Paper 2 - Question 10

Karen buys a door-number sign for her house.

The sign consists of parts of two identical circles.

AB is a chord to both circles.



- AB has length 15 centimetres.
- The radius AC has length 10 centimetres.

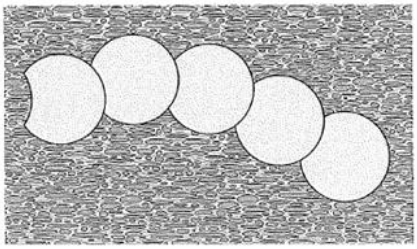
Calculate the width of the sign. 4

Click here for video solution.

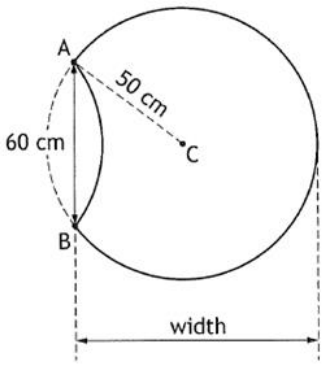
2023 - Paper 1 - Question 10

Alan buys some identical paving slabs to make a path.

Each slab is part of a circle.



The diagram below shows a single slab.



The circle, centre C, has a radius of 50 centimetres.

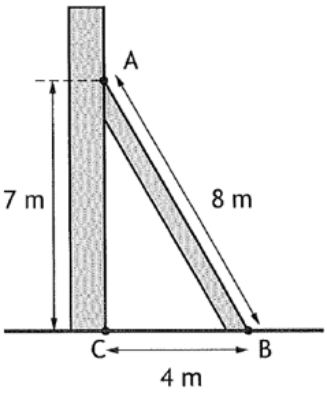
Length AB is 60 centimetres.

Calculate the width of the paving slab. 4

Click here for video solution.

2023 - Paper 2 - Question 8

A wooden beam is used to support a wall built on horizontal ground as shown in the diagram.



The edge of the beam, AB, is 8 metres long.

C is at the foot of the wall.

A is 7 metres from C.

B is 4 metres from C.

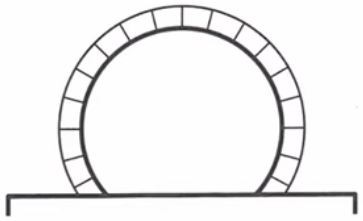
Determine whether the wall is perpendicular to the ground.

Justify your answer. 4

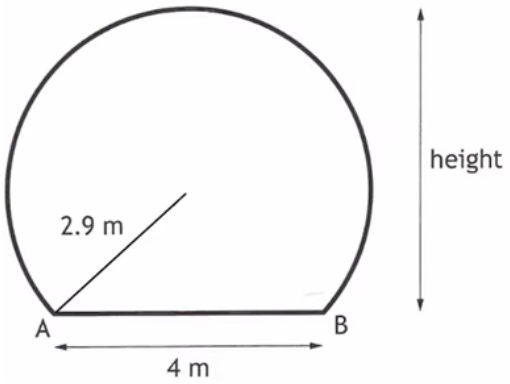
Click here for video solution.

2022 - Paper 2 - Question 8

A train tunnel has a circular cross-section with a horizontal floor.



A diagram of the cross-section is shown below.



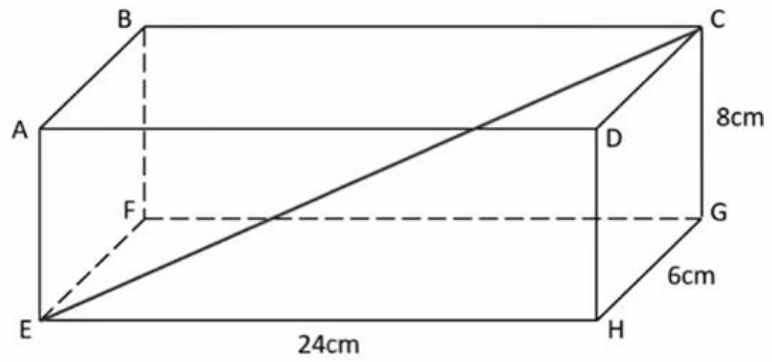
- The centre of the circle is O.
- Chord AB is 4 metres.
- The radius OA is 2.9 metres.

Calculate the height of the tunnel. 4

Click here for video solution.

2022 - Paper 2 - Question 11

The diagram shows a cuboid, ABCDEFGH.



- The length of the cuboid, EH, is 24 centimetres.
- The breadth of the cuboid, HG, is 6 centimetres.
- The height of the cuboid, CG, is 8 centimetres.

Calculate the length of EC, the space diagonal of the cuboid. 3

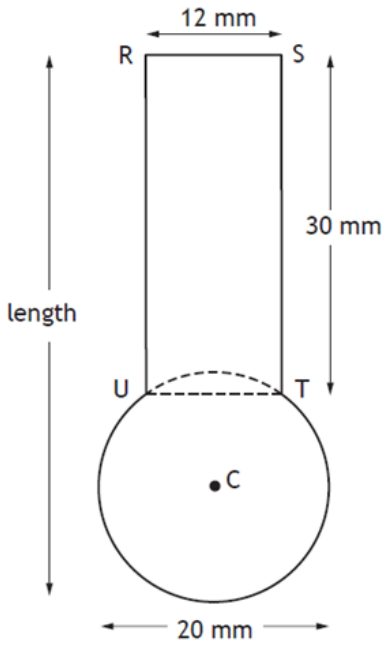
Click here for video solution.

2021 - Paper 1 - Question 18

The diagram below shows a design for a memory stick.

The design consists of a rectangle, RSTU and part of a circle, centre C.

memory stick



- RS = UT = 12 millimetres
- RU = ST = 30 millimetres
- The diameter of the circle is 20 millimetres
- UT is a chord of the circle

Calculate the length of the memory stick. 4

Click here for video solution.

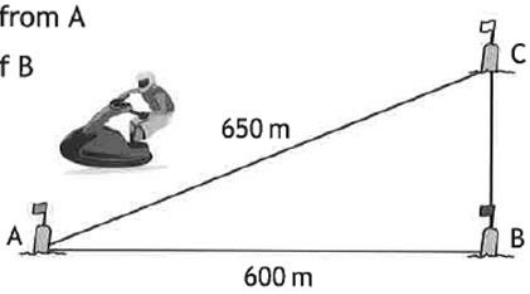
2019 - Paper 2 - Question 11

The diagram shows the course for a jet-ski race.

The course is indicated by markers A, B and C.

The total length of the course is 1500 metres.

- B is 600 metres from A
- C is 650 metres from A
- C is due north of B



Determine whether B is due east of A.

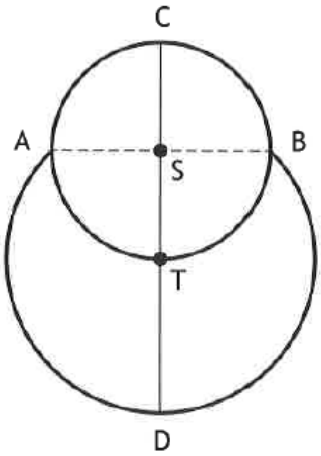
Justify your answer. **4**

Click here for video solution.

2019 - Paper 2 - Question 18

The picture shows a cartoon snowman.

The diagram below represents the snowman.



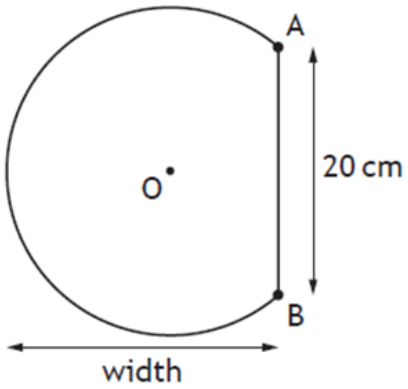
- The head is a small circle, centre S, with diameter 15 centimetres
- The body is part of a larger circle, centre T
- The point T lies on the circumference of the small circle
- The points A and B lie on the circumferences of both circles

Calculate CD, the height of the snowman. **4**

Click here for video solution.

2018 - Paper 2 - Question 12

The shape below is part of a circle, centre O.



The circle has radius 13 centimetres.

AB is a chord of length 20 centimetres.

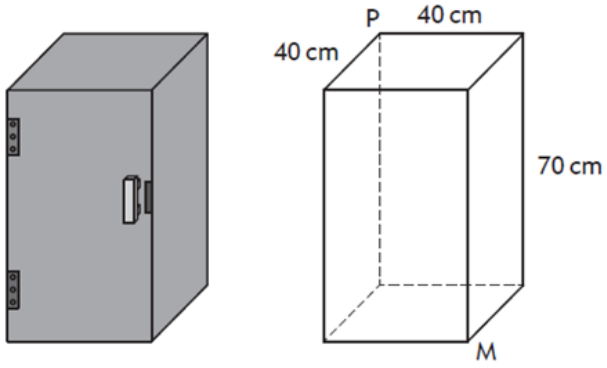
Calculate the width of the shape. 4

Click here for video solution.

2018 - Paper 2 - Question 16

Chris wants to store his umbrella in a locker.

The locker is a cuboid with internal dimensions of length 40 centimetres, breadth 40 centimetres and height 70 centimetres.



The umbrella is 85 centimetres long.

He thinks it will fit into the locker from corner P to corner M.

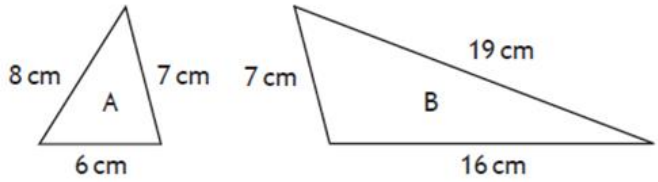
Is he correct?

Justify your answer. 4

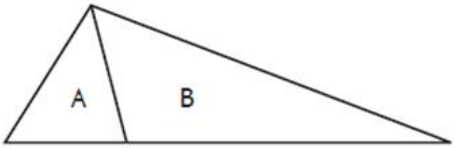
Click here for video solution.

2017 - Paper 2 - Question 7

Triangles A and B are shown below.



The triangles are placed together to form the larger triangle shown below.



Is this larger triangle right-angled?

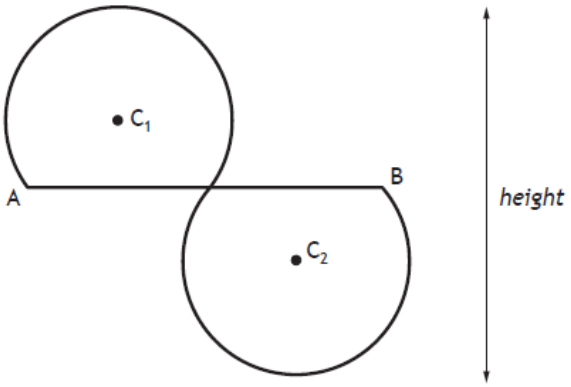
Justify your answer. 3

Click here for video solution.

2017 - Paper 2 - Question 13

Two identical shapes are used to form a logo.

Each shape is part of a circle.

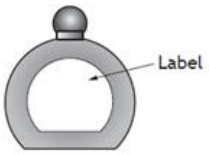


- The circles have centres C_1 and C_2.
- The radius of each circle is 14 centimetres.
- The logo has half-turn symmetry about the mid-point of AB.
- AB is 48 centimetres long.

Calculate the height of the logo. 4

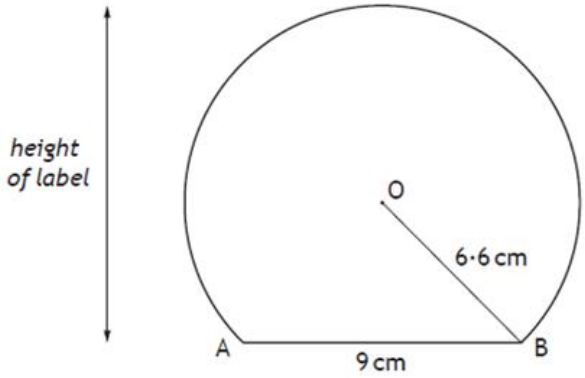
Click here for video solution.

2016 - Paper 2 - Question 15



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

A diagram of the label is shown below.



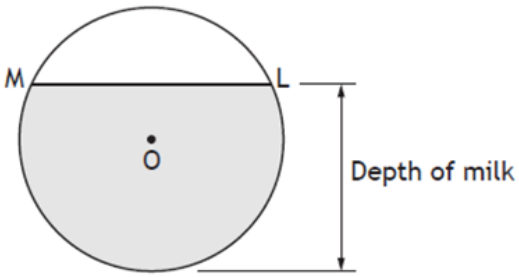
- The centre of the circle is O.
- The chord AB is 9 centimetres.
- The radius OB is 6·6 centimetres.

Find the height of the label. 4

Click here for video solution.

2015 - Paper 2 - Question 12

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



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

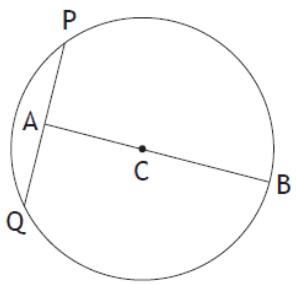
The width of the surface of the milk in the tank, represented by ML in the diagram, is 1·8 metres.

Calculate the depth of the milk in the tank. 4

Click here for video solution.

2014 - Paper 1 - Question 12

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. 4

Click here for video solution.

2014 - Paper 2 - Question 6

The diagram below shows the position of three towns.

Lowtown is due west of Midtown.

The distance from

- Lowtown to Midtown is 75 kilometres.
- Midtown to Hightown is 110 kilometres.
- Hightown to Lowtown is 85 kilometres.

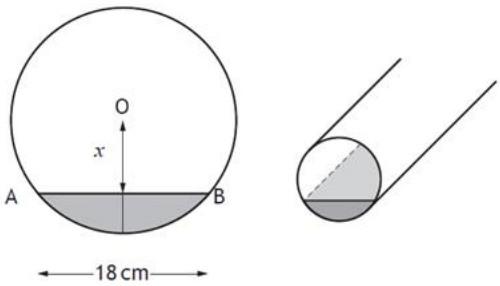
Is Hightown directly north of Lowtown?

Justify your answer. 4

Click here for video solution.

Specimen - Paper 1 - Question 12

A cylindrical pipe has water in it as shown.



The depth of the water at the deepest point is 5 centimetres.

The width of the water surface, AB, is 18 centimetres.

The radius of the pipe is r centimetres.

The distance from the centre, O, of the pipe to the water surface is x centimetres.

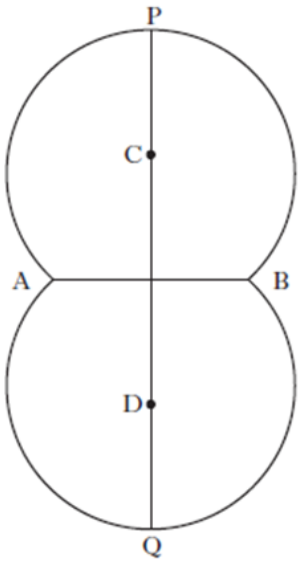
(a) Write down an expression for x in terms of r. 1

(b) Calculate r, the radius of the pipe. 3

Click here for video solution.

2013 - Paper 2 - Question 12

The shape below is used as a logo in an advertising campaign. It is made up from segments of two identical circles.



The points C and D are the centres of the circles and each circle has a radius of 24 centimetres.

AB is a common chord of length 30 centimetres.

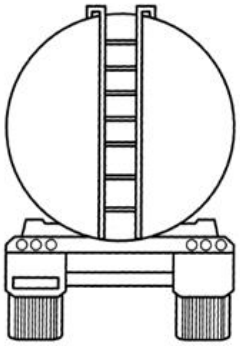
Calculate the height of the logo, represented by the line PQ. 5

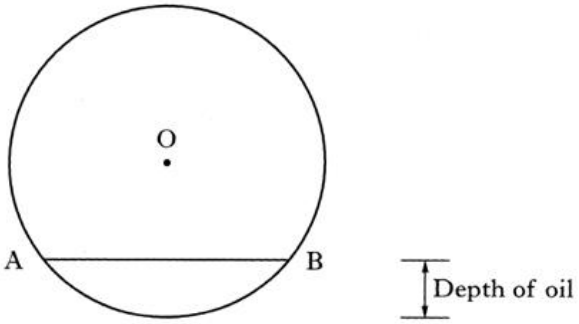
Click here for video solution.

2012 - Paper 2 - Question 10

A tanker delivers oil to garages.

The tank has a circular cross-section as shown in the diagram below.





The radius of the circle, centre O, is 1·9 metres.

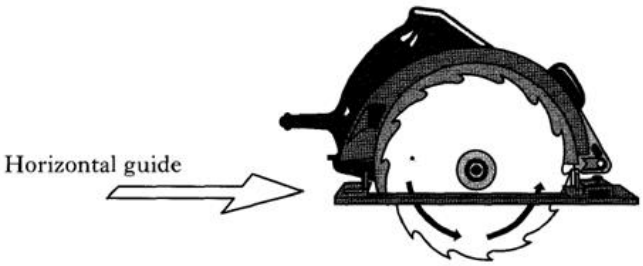
The width of the surface of the oil, represented by AB in the diagram, is 2·2 metres.

Calculate the depth of the oil in the tanker. **4**

Click here for video solution.

2011 - Paper 2 - Question 12

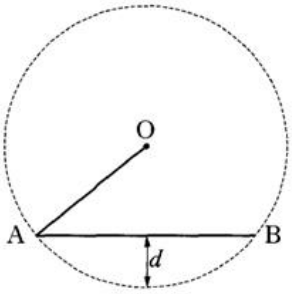
A circular saw can be adjusted to change the depth of blade that is exposed below the horizontal guide.



The circle, centre O, below represents the blade and the line AB represents part of the horizontal guide.

This blade has a radius of 110 millimetres.

If AB has length 140 millimetres, calculate the depth, d millimetres, of saw exposed.



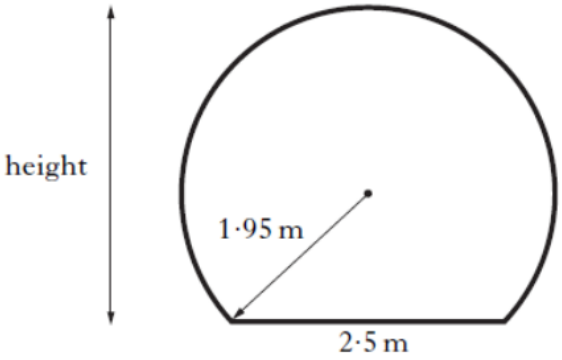
4

Click here for video solution.

2010 - Paper 2 - Question 13

Ocean World has an underwater viewing tunnel.

The diagram below shows the cross-section of the tunnel. It consists of part of a circle with a horizontal base.



The radius of the circle is 1·95 metres and the width of the base is 2·5 metres.

Calculate the height of the tunnel. 4

Click here for video solution.

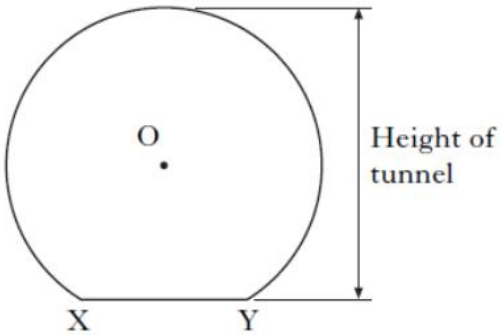
2009 - Paper 2 - Question 14

A railway goes through an underground tunnel.

The diagram below shows the cross-section of the tunnel. It consists of part of a circle with a horizontal base.

- The centre of the circle is O.
- XY is a chord of the circle.
- XY is 1·8 metres.
- The radius of the circle is 1·7 metres.

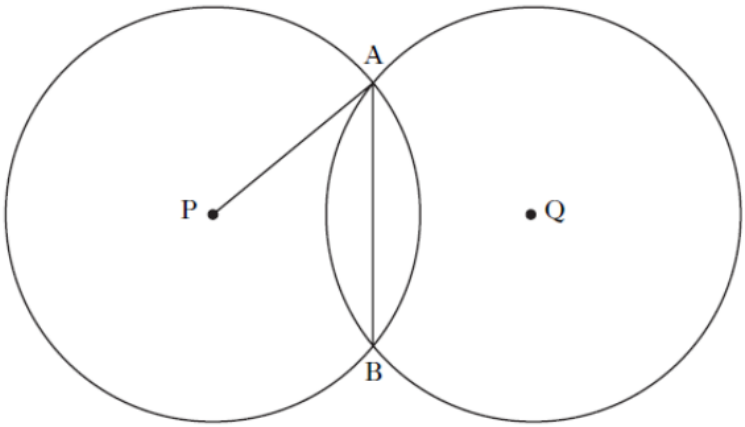
Find the height of the tunnel. 4



Click here for video solution.

2008 - Paper 2 - Question 9

Two identical circles, with centres P and Q, intersect at A and B as shown in the diagram.



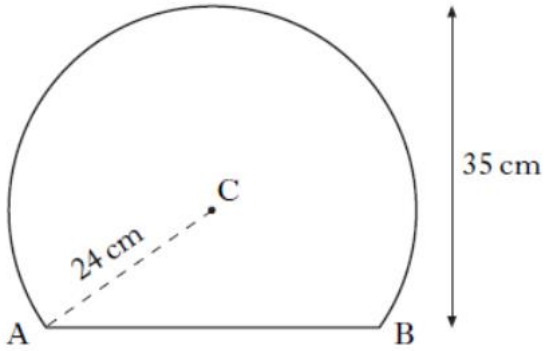
The radius of each circle is 10 centimetres.
The length of the common chord, AB, is 12 centimetres.

Calculate PQ, the distance between the centres of the two circles. **5**

Click here for video solution.

2007 - Paper 2 - Question 14

A mirror is shaped like part of a circle.

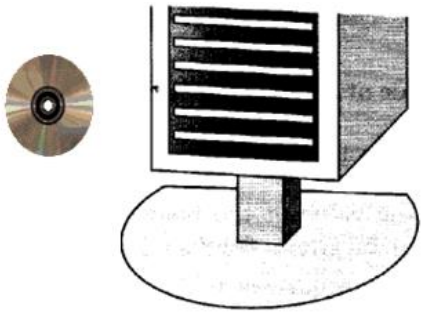


The radius of the circle, centre C, is 24 centimetres.
The height of the mirror is 35 centimetres.

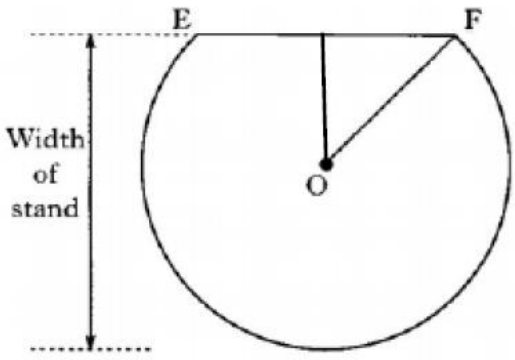
Calculate the length of the base of the mirror, represented in the diagram by AB. **3**

Click here for video solution.

2006 - Paper 2 - Question 4



The diagram shows the base of a compact disc stand which has the shape of part of a circle.

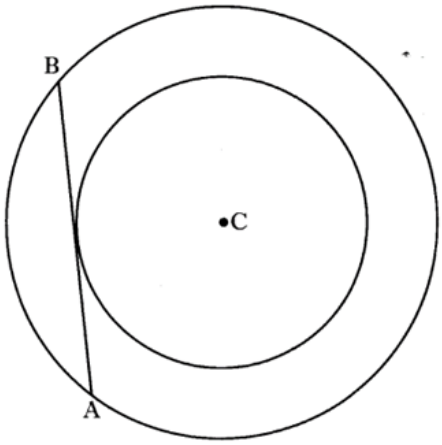


- The centre of the circle is O.
- EF is a chord of the circle.
- EF is 18 centimetres.
- The radius, OF, of the circle is 15 centimetres.

Find the width of the stand. **4**

Click here for video solution.

2003 - Paper 1 - Question 7



C is the centre of two concentric circles.
AB is a tangent to the smaller circle and a chord of the larger circle.
The radius of the smaller circle is 6 centimetres and the chord AB has length 16 centimetres.
Calculate the radius of the larger circle. **3**

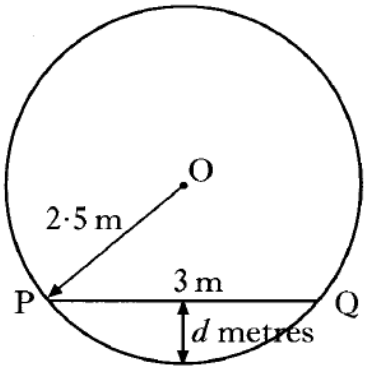
Click here for video solution.

2002 - Paper 2 - Question 9

The diagram below shows a circular cross-section of a cylindrical oil tank.

In the figure below,

- O represents the centre of the circle
- PQ represents the surface of the oil in the tank
- PQ is 3 metres
- the radius OP is 2·5 metres.



Find the depth, d metres, of oil in the tank. **4**

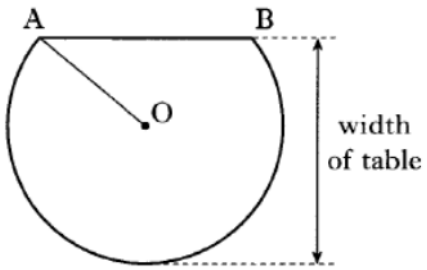
Click here for video solution.

2000 - Paper 2 - Question 3

The diagram shows a fold-away table whose top is in the shape of part of a circle.

- The centre of the circle is O.
- AB is a chord of the circle.
- AB is 70 centimetres.
- The radius, OA, is 40 centimetres.

Find the width of the table.



4

Click here for video solution.