Maths.scot

National 5 Maths
Arcs and Sectors

SQA past paper and specimen paper questions and answers by topic

Visit Maths.scot for full worked solutions to each of these questions.

National 5 Maths
SQA 2013 Specimen
Paper 2 Question 11

National 5 Maths
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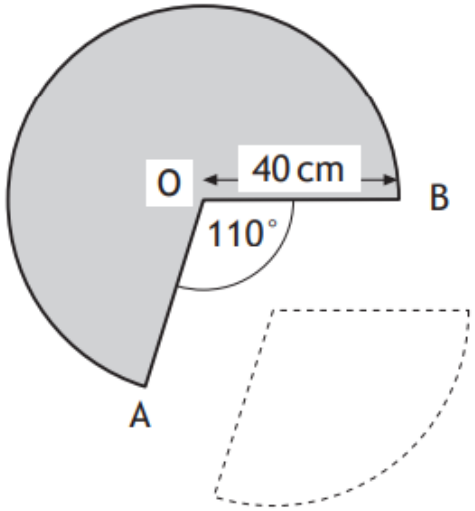
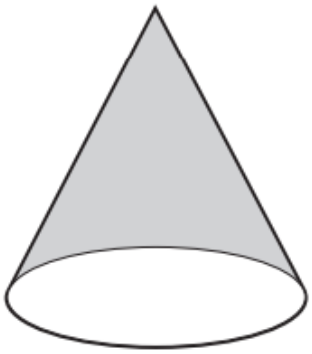
A cone is formed from a paper circle with a sector removed as shown.

The radius of the paper circle is 40 centimetres.

Angle AOB is 110°.





(a) Calculate the area of the sector removed from the circle. **3**

(b) Calculate the circumference of the base of the cone. **3**

Answers:

(a) 1536 cm^2

(b) 175 cm (approximately)

National 5 Maths
SQA 2014 Paper 2
Question 13

National 5 Maths
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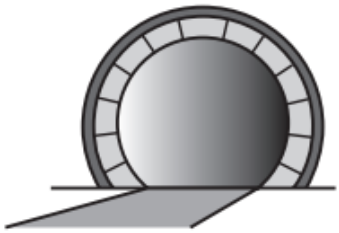
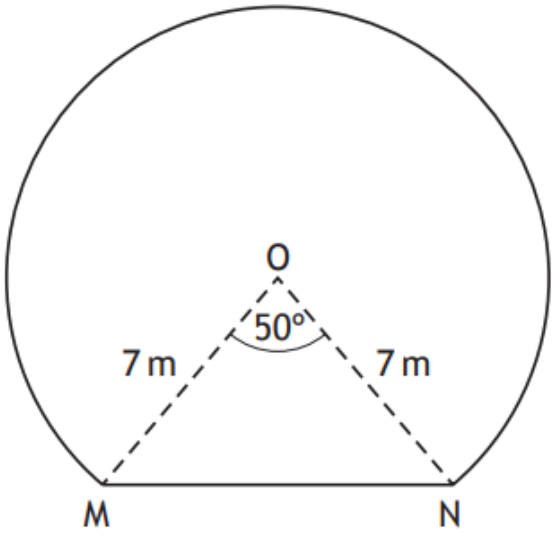
The picture shows the entrance to a tunnel which is in the shape of part of a circle.



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. **5**

Answer:

151.3 m^2

National 5 Maths
SQA 2015 Paper 2
Question 10

National 5 Maths
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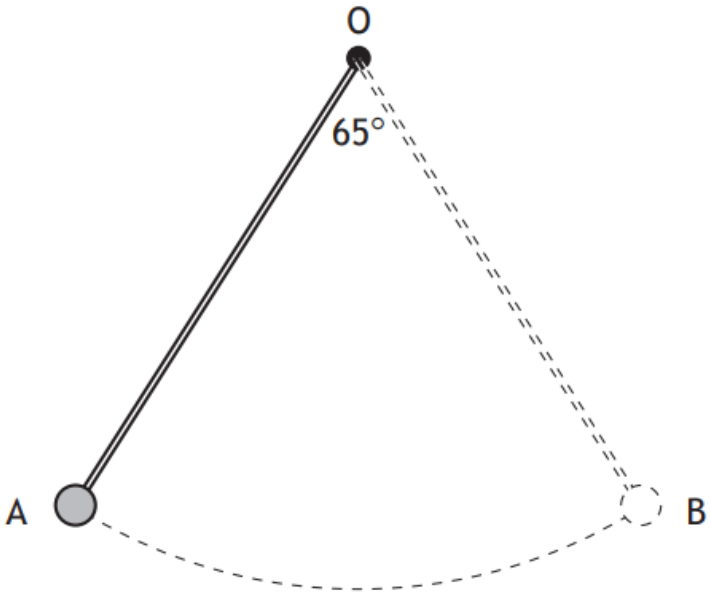
The pendulum of a clock swings along an arc of a circle, centre O.



The pendulum swings through an angle of 65°, travelling from A to B.

The length of the arc AB is 28·4 centimetres.

Calculate the length of the pendulum. **4**

Answer:

25.0 cm

National 5 Maths
SQA 2016 Paper 1
Question 3

National 5 Maths
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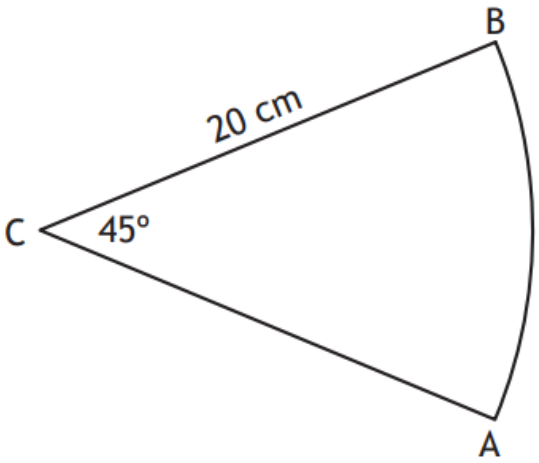
The diagram shows a sector of a circle, centre C.



The radius of the circle is 20 centimetres and angle ACB is 45°.

Calculate the area of the sector.

Take $\pi = 3{\cdot}14$. **3**

Answer:

157 cm^2

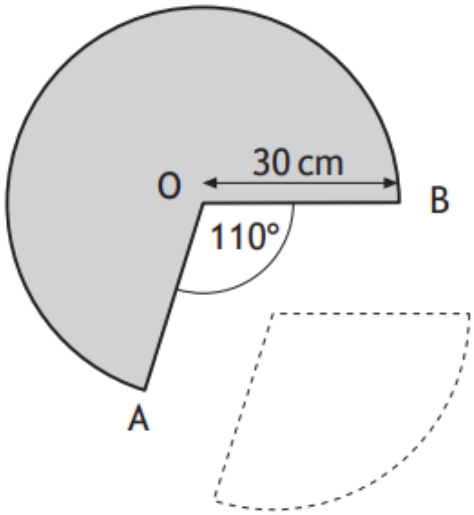
National 5 Maths
SQA 2017 Specimen
Paper 2 Question 11

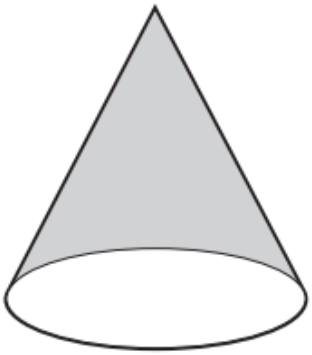
National 5 Maths
Maths.scot

A cone is formed from a paper circle with a sector removed as shown.

The radius of the paper circle is 30 centimetres.

Angle AOB is 110°.





(a) Calculate the area of the sector removed from the circle. **3**

(b) Calculate the circumference of the base of the cone. **3**

Answers:

(a) 864 cm^2

(b) 131 cm (approximately)

National 5 Maths
SQA 2017 Paper 2
Question 14

National 5 Maths
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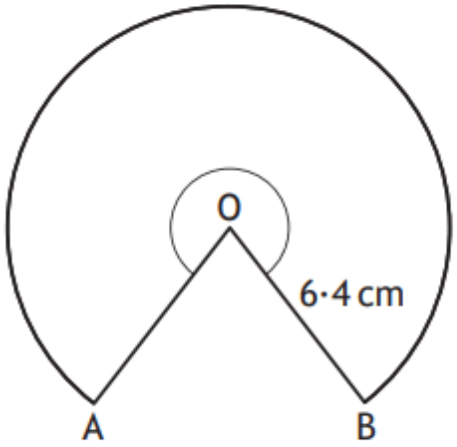
The diagram below shows part of a circle, centre O.



The radius of the circle is 6·4 centimetres.

Major arc AB has length 31·5 centimetres.

Calculate the size of the reflex angle AOB. **3**

Answer:

282.0°

National 5 Maths
SQA 2018 Paper 2
Question 2

National 5 Maths
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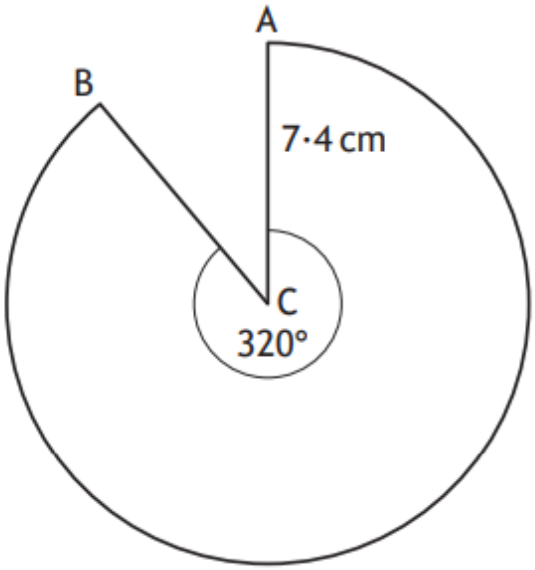
The diagram below shows a sector of a circle, centre C.



The radius of the circle is 7·4 centimetres.

Calculate the length of the major arc AB. **3**

Answer:

41.32 cm

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SQA 2018 Paper 2
Question 17

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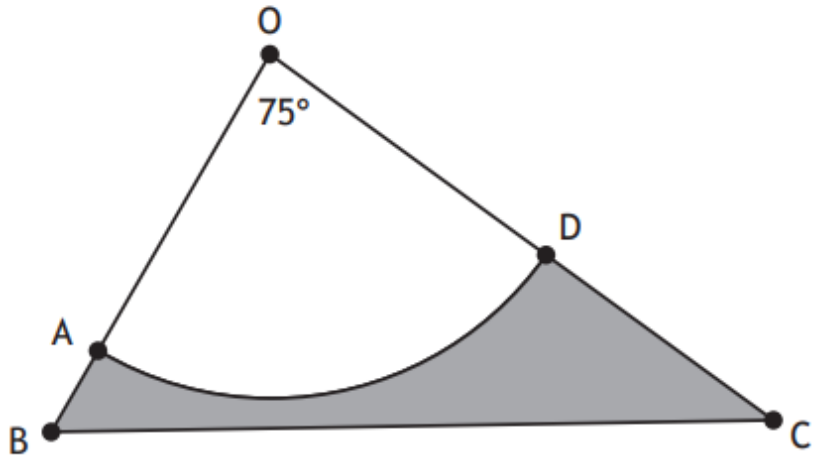
In the diagram below AOD is a sector of a circle, with centre O, and BOC is a triangle.



In sector AOD:

- radius = 30 centimetres
- angle AOD = 75°.

In triangle OBC:

- OB = 38 centimetres
- OC = 55 centimetres.

Calculate the area of the shaded region, ABCD. **5**

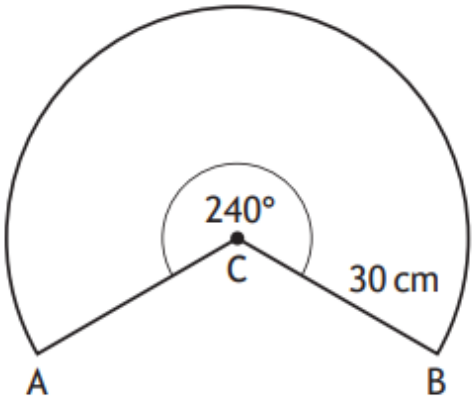
Answer:

420.3 cm^2

National 5 Maths
SQA 2019 Paper 1
Question 4

National 5 Maths
Maths.scot

The diagram below shows a sector of a circle, centre C.



The radius of the circle is 30 centimetres.

Calculate the length of the major arc AB.

Take $\pi = 3{\cdot}14$. **3**

Answer:

125.6 cm

National 5 Maths
SQA 2019 Paper 2
Question 12

National 5 Maths
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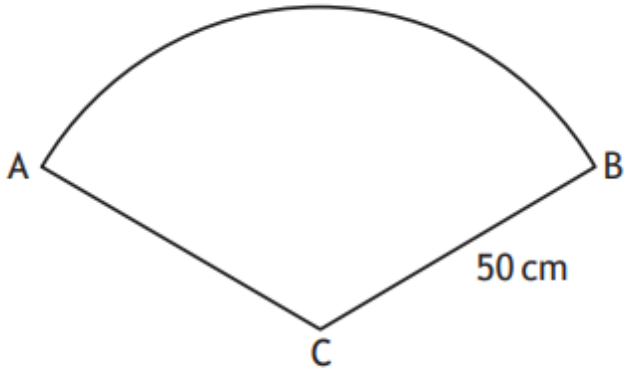
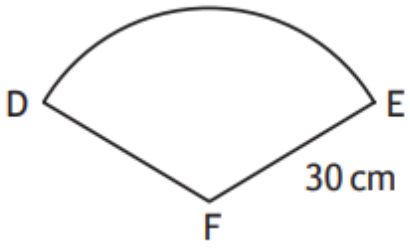
In the diagram

- ABC is a sector of a circle, centre C
- DEF is a sector of a circle, centre F.





The sectors are mathematically similar.

The area of the larger sector, ABC, is 2750 square centimetres.

(a) Calculate the area of the smaller sector, DEF. **3**

(b) Calculate the size of angle ACB. **3**

Answers:

(a) 990 cm^2

(b) 126.1°

National 5 Maths
SQA 2022 Paper 2
Question 8

National 5 Maths
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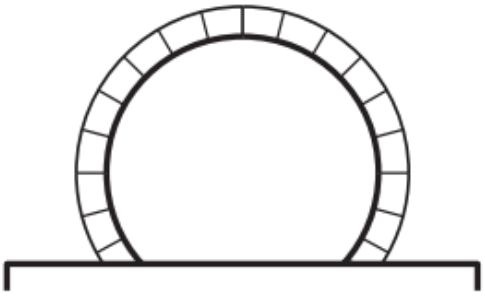
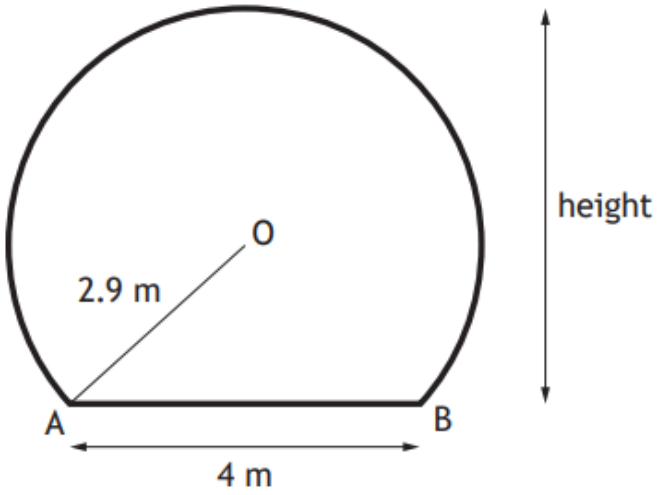
A train tunnel has a circular cross-section with a horizontal floor.



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**

Answer:

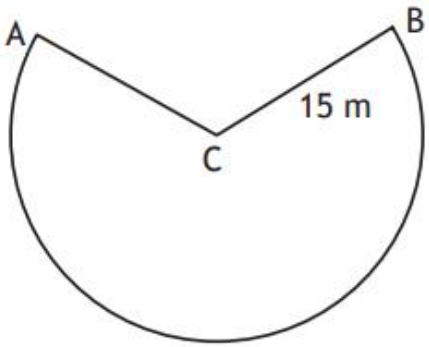
5 m

National 5 Maths
SQA 2022 Paper 2
Question 10

National 5 Maths
Maths.scot

An attraction at a theme park has a carriage attached to an arm.

The arm swings from A to B along the arc of a circle, centre C, as shown in the diagram below.



- The length of the arm, CB, is 15 metres.
- The length of the major arc, AB, is 69.4 metres.

Calculate the size of the reflex angle ACB. **3**

Answer:

265.1°

National 5 Maths
SQA 2023 Paper 2
Question 3

National 5 Maths
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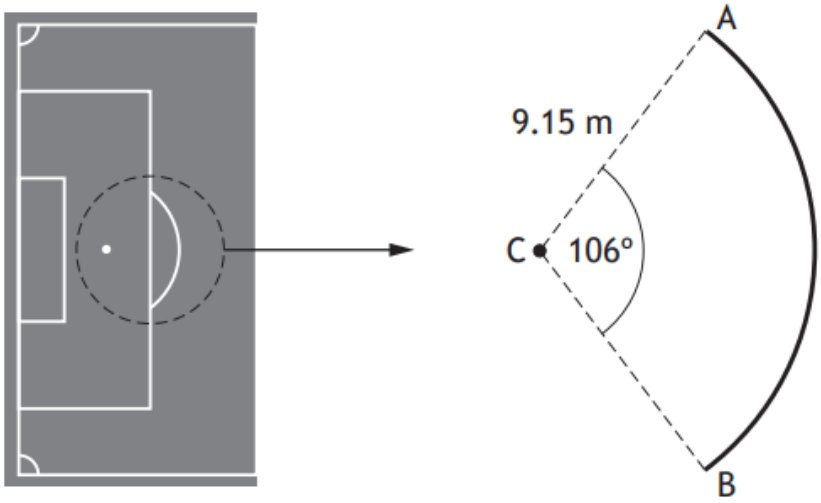
The diagram shows part of a football pitch.



The penalty spot is marked at point C.

AB is an arc of a circle, centre C, radius 9.15 metres.

Calculate the length of the arc AB. **3**

Answer:

16.9 metres

National 5 Maths
SQA 2024 Paper 2
Question 15

National 5 Maths
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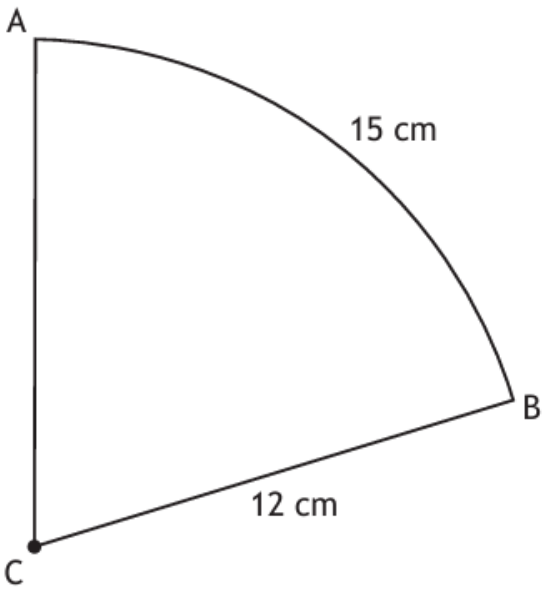
The diagram shows a sector of a circle, centre C.



The radius of the circle is 12 centimetres.

The length of arc AB is 15 centimetres.

Calculate the area of the sector. **3**

Answer:

90 cm^2

National 5 Maths
SQA 2025 Paper 2
Question 6

National 5 Maths
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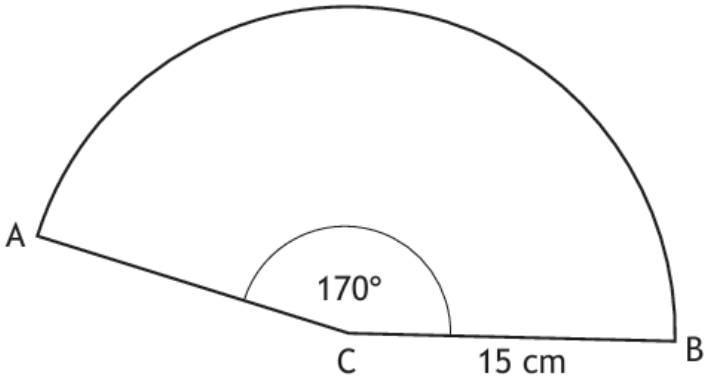
A party hat is made in the shape of a cone, as shown.

The piece of card used for making the hat is a sector of a circle, centre C.



The radius of the circle is 15 centimetres and angle ACB is 170°.

Calculate the area of the sector. **3**

Answer:

333.8 cm^2