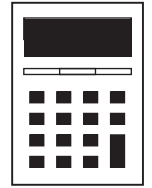# GCSE MATHEMATICS

Arcs & Sector Area

AQA These questions have been taken or modified from previous AQA GCSE Mathematics Papers.

Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information
- The marks for questions are shown in brackets.
- The quality of your written communication is specifically assessed in questions that are indicated with an asterisk (*).

Advice
- Read each question carefully before you start to answer it.
- In all calculations, show clearly how you work out your answer.
- Use the number of marks for the question as a guide to the amount of time you need to spend.
- Look at previous parts of the question, e.g. a), b), c) i) as there may be information there you need to answer later parts.
- Check your answer is realistic and appropriate.
- For calculator decimal numbers always write your full calculator display in the working out area and then, if you need to, round the answer on the answer line.

www.thecalculatorguide.com

1 *OAB* is a sector of a circle of radius 12 cm

Angle *AOB* = 60º

A

12 cm

Not drawn
accurately

60º

O   B
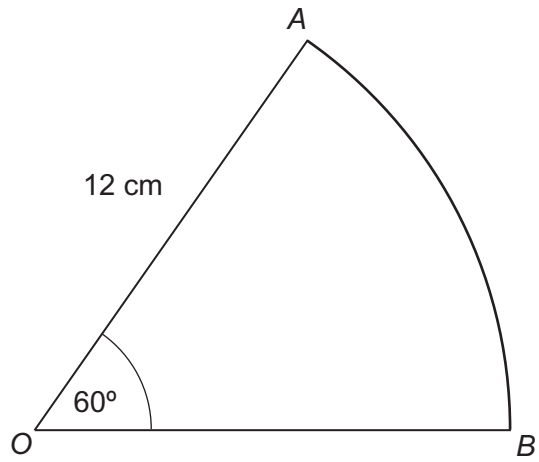
Work out the length of the arc *AB*.

Give your answer in terms of π.

[2 marks]

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Answer .... cm

2   *OAB* is a sector of a circle of radius 15 cm.
Angle *AOB* = 80º

15 cm

80º

A

O   *B*
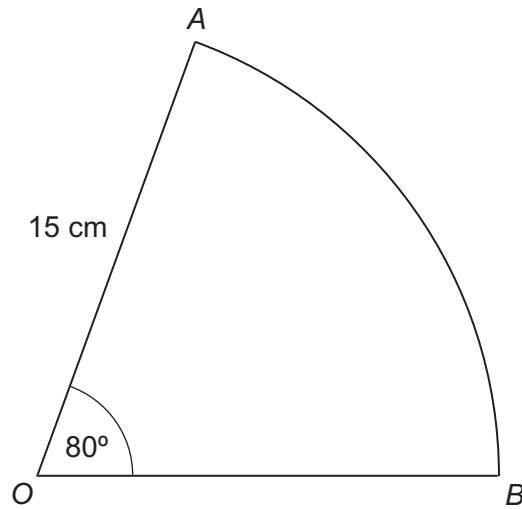
Not drawn accurately

Work out the **perimeter** of the sector *OAB*.

[3 marks]

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Answer .... cm

3   The diagram shows a sector of a circle, radius 12 cm.

Not drawn
accurately

135°

12 cm
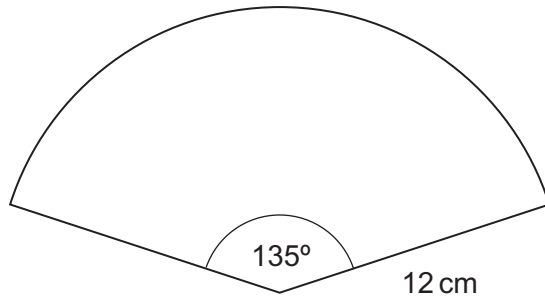
Show that the **perimeter** of the sector is greater than 52 cm.

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(3 marks)

4   A playground is in the shape of a major sector of a circle of radius 15 metres.

Not drawn
accurately

Playground

60º

15 m   15 m
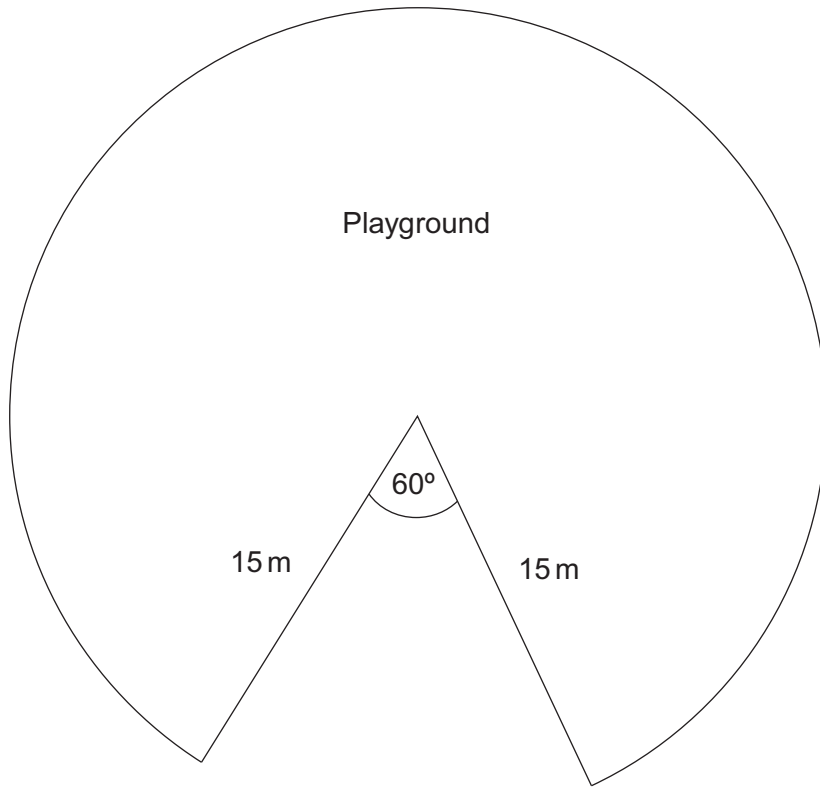
Work out the **total** perimeter of the playground.

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Answer .... m   *(3 marks)*

5 The diagram shows the metal framework on a window.

AB and *CD* are arcs of circles, each with centre *O*.
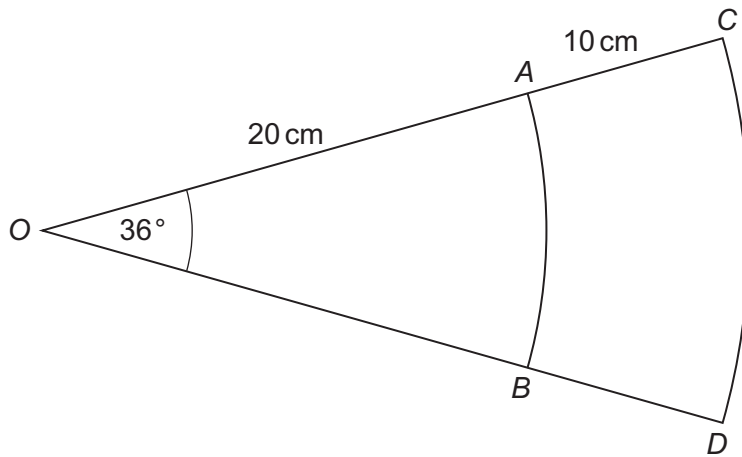
Not drawn accurately

5 (a) Show that the length of arc *AB*, in cm, is 4π.

[2 marks]

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5 (b) Work out the **total** length of metal in the framework.
Give your answer in its simplest form in terms of π.

[3 marks]

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Answer .... cm

6 The diagram shows a sector of a circle with radius 9.2 cm

Not drawn accurately

125º

9.2 cm
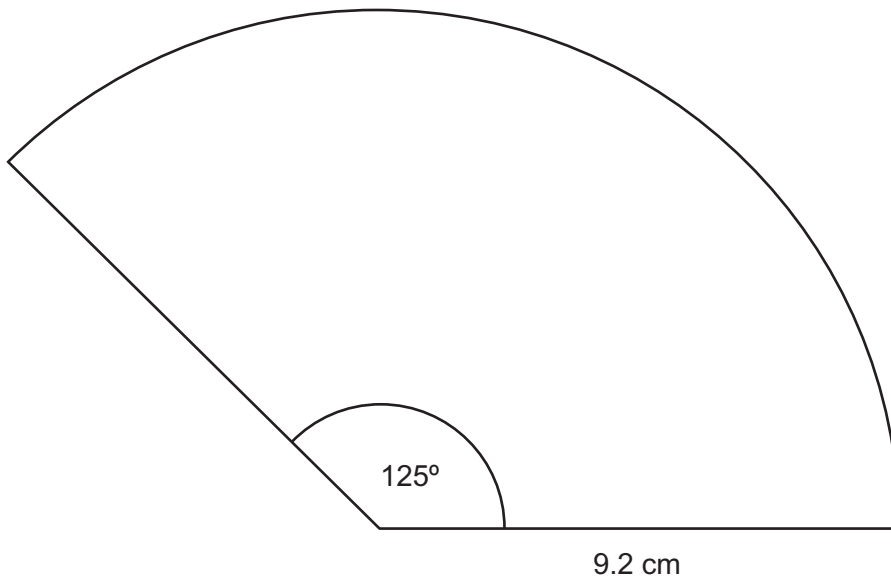
6 (a) Work out the area of the sector.

[3 marks]

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Answer .... cm²

6 (b) Work out the area of the shaded segment.

Not drawn
accurately

125°

9.2 cm
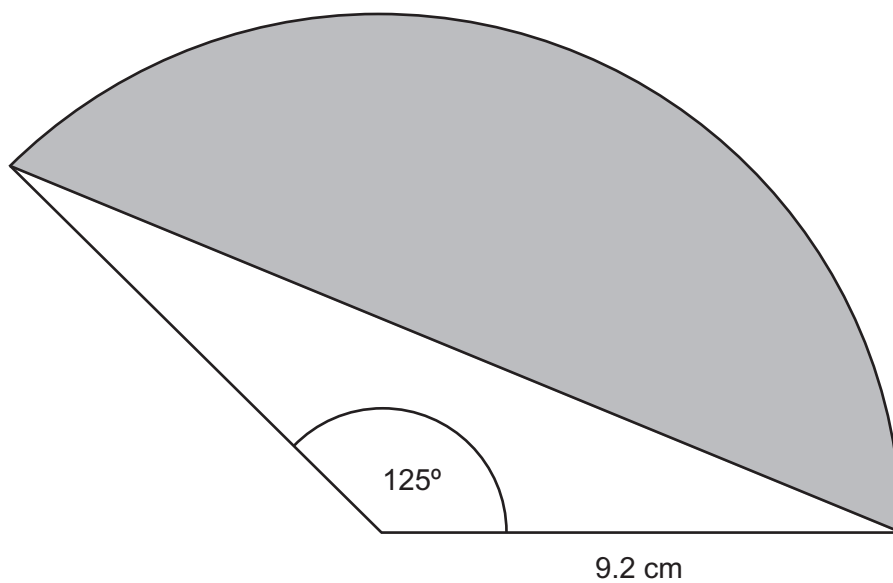
[3 marks]

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Answer .... cm²

7   The diagram shows a sector of a circle, centre *O*, radius 18 cm

Not drawn accurately

18 cm

A

B

40°

O
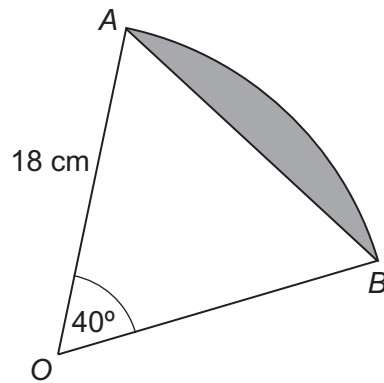
Work out the area of the shaded segment.

[3 marks]

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Answer .... cm²

8 *ABCD* represents a piece of leather used as part of a jacket.
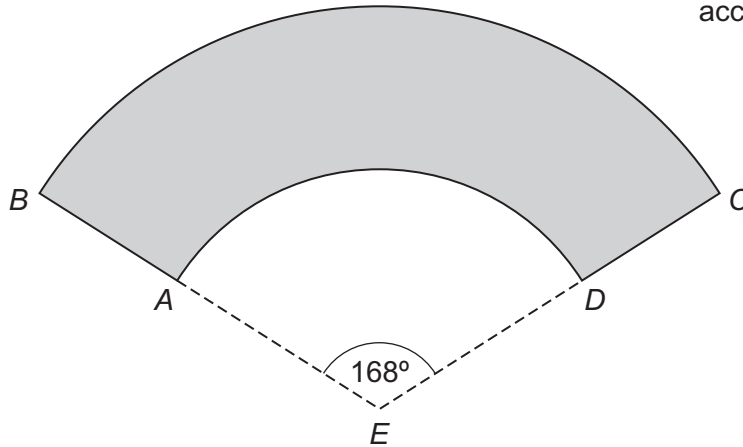
Arcs *BC* and *AD* each have centre *E*.

BE = 150 mm

AE = 82 mm

Angle *AED* = 168º

Not drawn accurately

The piece has edging around the perimeter.

Work out the total length of the edging.
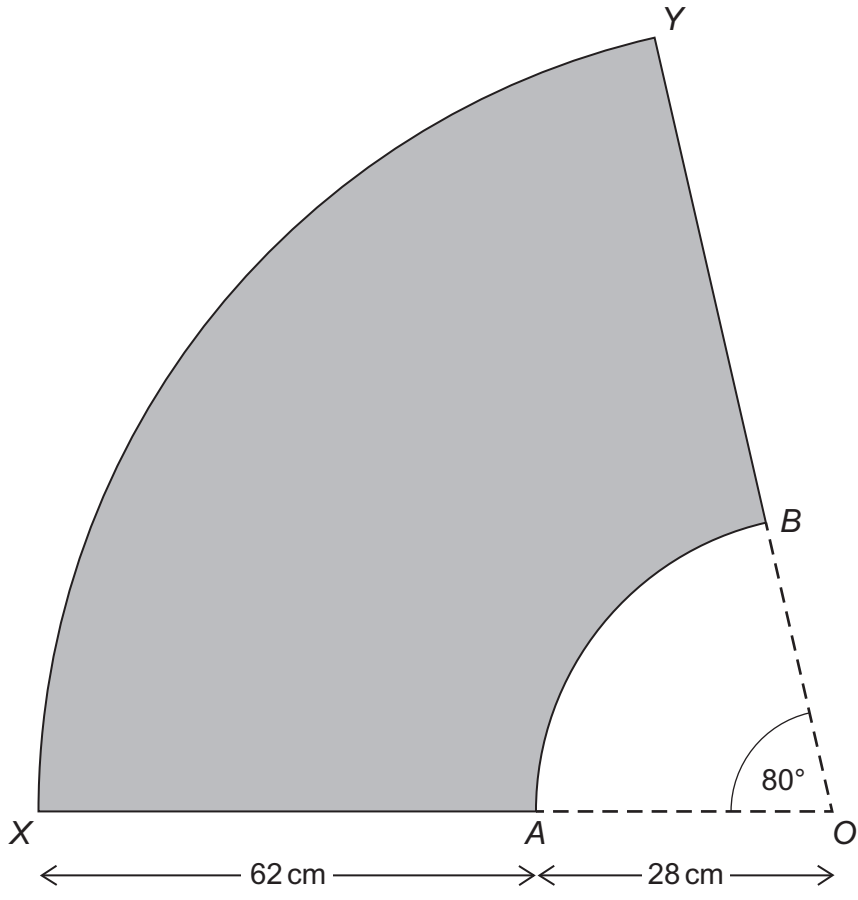Give your answer to the nearest millimetre.

[5 marks]

Answer _____ mm

9 A wiper blade on a windscreen cleans the shaded area shown.
OAB and *OXY* are sectors of a circle, centre *O*.

Not drawn
accurately

Calculate the area of the windscreen which the wiper cleans.

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Answer .... cm^2 *(5 marks)*

10   The **shaded** section *ABC* shows the plan view of a silver pendant.

OAB is a sector of a circle, centre *O*, radius 95 mm
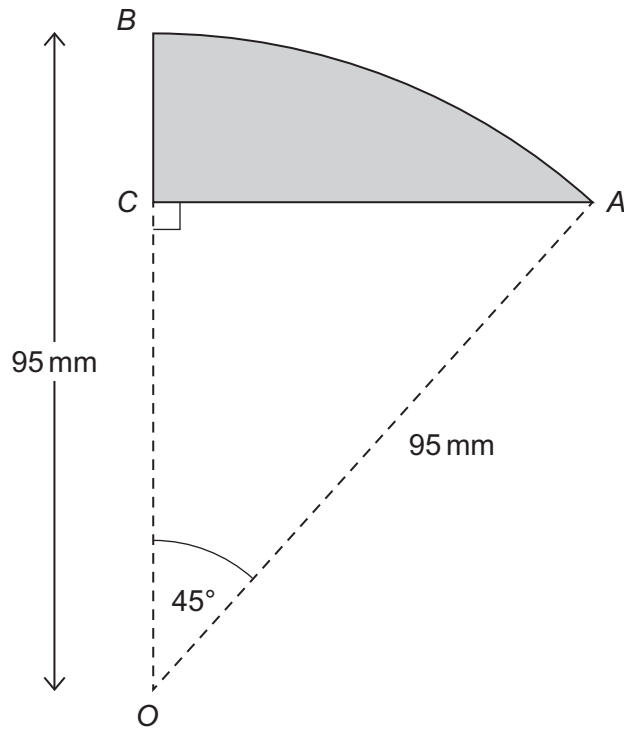
Not drawn
accurately

10 (a)   Work out the area of the **sector** *OAB*.

[3 marks]

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Answer .... mm²

10 (b)　　Show that *OC* = 67.2 mm to 3 significant figures.

[2 marks]

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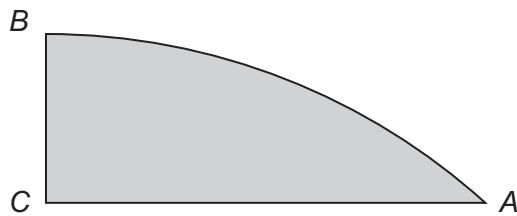
10 (c)　　The silver pendant is a prism with thickness 2.5 mm
The cross section is shown.

B

Not drawn
accurately

C　　　　　　　　　　　　　　　　A

Work out the volume of silver in the pendant.

[3 marks]

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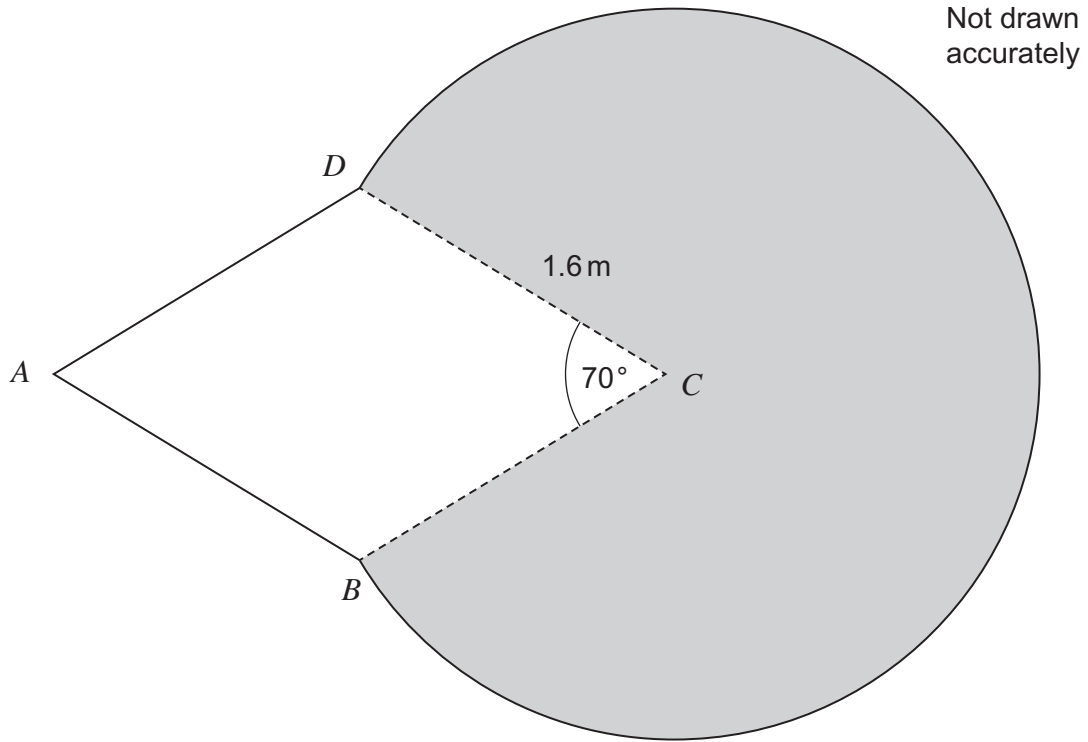Answer .... mm^3

11 A logo for a bird sanctuary is shown.

BD is a major arc of a circle, radius 1.6 metres, centre *C*.
ABCD is a rhombus.

Not drawn accurately

11 (a) The shaded area is painted.

Work out the area that is painted.

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Answer .... m² *(3 marks)*

11 (b)   The logo just fits on a rectangular board.

A   D   1.6 m   70°   C   B   x

Not drawn accurately
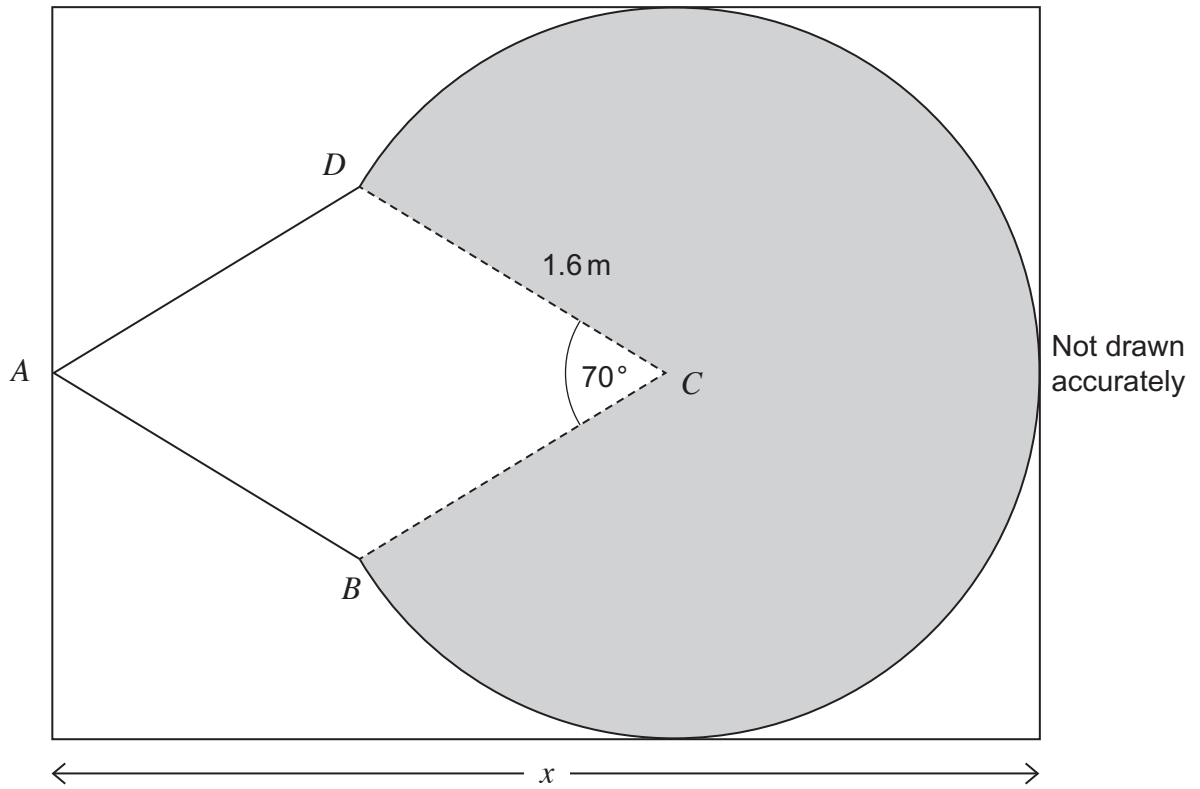
Work out the length, x, of the rectangular board.

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Answer .... m   *(4 marks)*