Write your name, centre number and candidate number in the boxes below.

Surname	Other names

Centre number | | | | | |

Candidate number | | | | |

STEM | Exam Builder

Circles, arcs and sectors

Time allowed: 40 minutes

Subject code **0580**

Mathematics

Questions from Paper 1 and Paper 2

You must have: a ruler marked in centimetres and millimetres, a protractor, compasses, a pen, an HB pencil and an eraser.
You may use a calculator.

Total marks

/ 31

Instructions

- Answer every question in the space provided on this paper.
- Write in black or dark blue ink. Pencil may be used for diagrams and graphs.
- Fill in your name, centre number and candidate number above.
- Show your working: a correct method can earn marks even if the answer is wrong.
- Unless a question says otherwise, give answers that are not exact to 3 significant figures, and angles in degrees to 1 decimal place.

Information

- This paper has 10 questions worth 31 marks in total.
- The marks for each question or part are shown in brackets, for example [3].

Advice

- Read every question through once before you write anything.
- Use the marks in brackets to judge how long to spend on each part.
- If you finish early, go back and check your working.

STEM | Exam Builder

Turn over ►

Print at 100% (Actual size) so diagrams keep their real measurements.

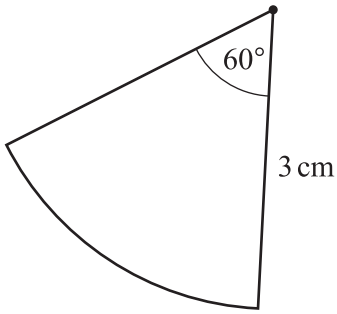
1 The diameter of a circle is 16 cm.

Find the area of the circle.
Leave your answer in terms of π.

..... cm^2 [2]

Area and circumference of circles Click for more variations

2



NOT TO SCALE

The diagram shows a sector of a circle with radius 3 cm and sector angle 60°.

Calculate the area of the sector.
Give your answer in terms of π in its simplest form.

..... cm^2 [2]

Arc length and sector area Click for more variations

STEM | Exam Builder

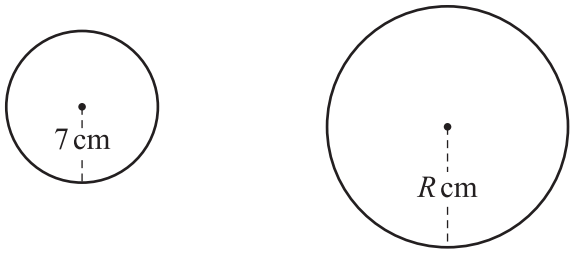
3 A circle has radius 7 cm.
A square has side x cm.
The circumference of the circle is the same length as the perimeter of the square.

Find the value of x.
Give your answer in terms of π.

$x =$ ..... [3]

Area and circumference of circles Click for more variations

4



NOT TO SCALE

The diagram shows a small circle with radius 7 cm and a large circle with radius R cm.
The area of 16 small circles is the same as the area of one large circle.

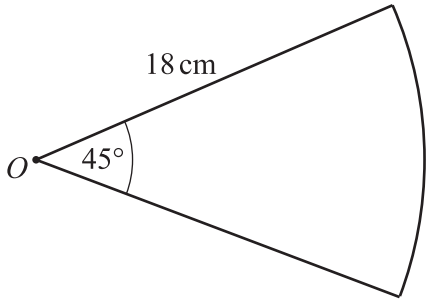
Calculate the value of R.

$R =$ ..... [3]

Area and circumference of circles Click for more variations

STEM | Exam Builder

5



NOT TO SCALE

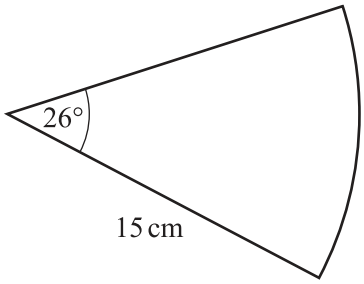
The diagram shows a sector of a circle, centre O.
The length of the arc is $n\pi$ cm .

Find the value of n.

$n =$ ..... [2]

Arc length and sector area Click for more variations

6



NOT TO SCALE

The diagram shows a sector of a circle with radius 15 cm.

Calculate the perimeter of this sector.

STEM | Exam Builder

Answer ..... cm [3]

Arc length and sector area Click for more variations

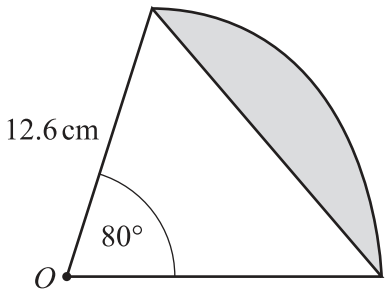
7 The perimeter of a sector of a circle with radius 8 cm is 26 cm.

Calculate the angle of this sector.

..... [3]

Arc length and sector area Click for more variations

8



NOT TO SCALE

The diagram shows a sector of a circle, centre O, radius 12.6 cm.

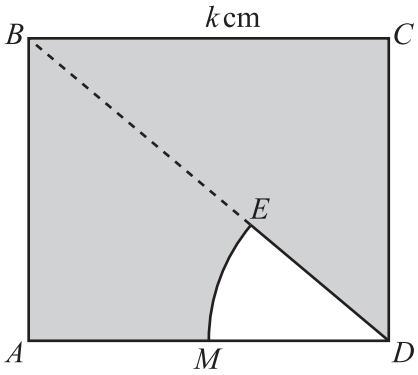
Calculate the perimeter of the shaded segment.

STEM | Exam Builder

..... cm [4]

Arc length and sector area Click for more variations

9



NOT TO SCALE

The diagram shows a square $ABCD$ with side length k cm.
MDE is a sector of a circle, centre D.
E lies on the diagonal, BD, of the square.
M is the midpoint of AD.

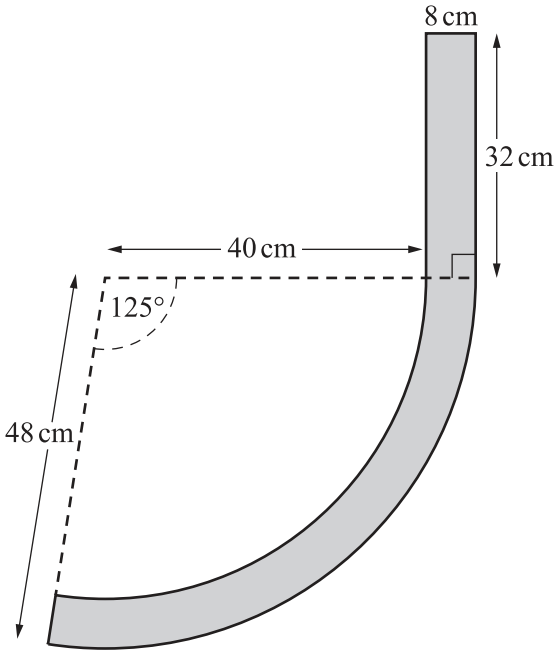
Find the percentage of the square that is shaded.

..... % [4]

Arc length and sector area Click for more variations

STEM | Exam Builder

10



NOT TO SCALE

The diagram shows the cross section of part of a park bench.
It is made from a rectangle of length 32 cm and width 8 cm and a curved section.
The curved section is made from two concentric arcs with sector angle 125°.
The inner arc has radius 40 cm and the outer arc has radius 48 cm.

Calculate the area of the cross section correct to the nearest square centimetre.

..... cm^2 [5]

Arc length and sector area Click for more variations

STEM | Exam Builder