

Formula for the circumference of a circle

Year 7 About 75 minutes Calculator allowed 48 marks



Hints online, answers free with an account:

mathswariz.uk/worksheets/ks3-year-7-formula-for-the-circumference-of-a-circle/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
 A circle has a diameter of 13 cm.
 Write down its radius.

Answer

Answer

- A3** Last lesson [1 mark] **A4** From chapter 13 [1 mark]
 Use $C \approx 3.1 \times d$ to estimate the circumference of a circle with diameter 30 cm.

Answer

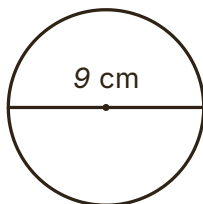
Answer

B Example, then your turn

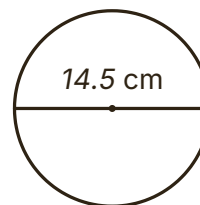
Year 7

Use the π key on your calculator. Your teacher works through each example with you. Then try the one beside it.**EXAMPLE 1**

Work out the circumference of the circle.
 Give your answer to 1 decimal place.

**Hint** $C = \pi d$. Multiply the diameter by π .

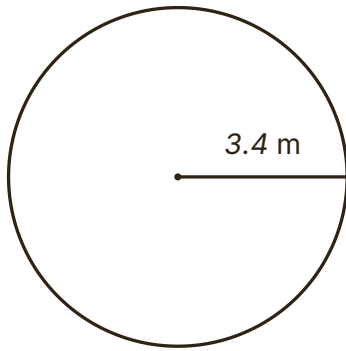
- B1** Work out the circumference of the circle. Give your answer to 1 decimal place. [2 marks]



Answer ... cm

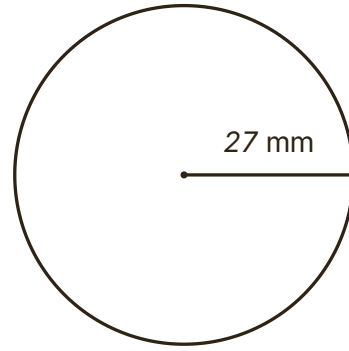
EXAMPLE 2

Work out the circumference of the circle.
Give your answer to 1 decimal place.



Hint The line from the centre is a radius. $C = 2\pi r$, or double the radius to get the diameter.

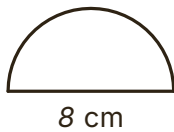
B2 Work out the circumference of [2 marks]
the circle. Give your answer to
1 decimal place.



Answer ... mm

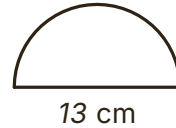
EXAMPLE 3

Work out the perimeter of the semicircle.
Give your answer to 1 decimal place.



Hint The curved part is half of a whole circumference. Then add the straight edge.

B3 Work out the perimeter of the [3 marks]
semicircle. Give your answer
to 1 decimal place.



Answer ... cm

EXAMPLE 4

A circle has a circumference of 50 cm. Work
out its diameter and its radius. Give each
answer to 1 decimal place.

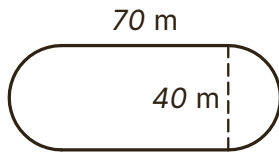
Hint $C = \pi d$, so $d = C \div \pi$.

B4 A circle has a circumference [3 marks]
of 85 cm. Work out its radius.
Give your answer to 1 decimal
place.

Answer ... cm

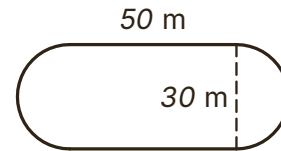
EXAMPLE 5

A running track has two straight sides of 70 m and two semicircular ends. Each end has a diameter of 40 m. Work out the distance round the track to the nearest metre.



Not drawn accurately

Hint Two semicircles make one whole circle.

B5 A field has two straight sides of 50 m and two semicircular ends, each with a diameter of 30 m. Work out the distance round the field to the nearest metre. [3 marks]

Not drawn accurately

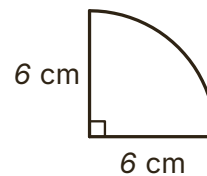
Answer ... m

c Practice

Year 7

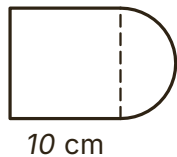
C1 A circle has a diameter of 35 cm. [3 marks]

Work out its circumference using $\pi = 3.14$, and again using $\pi = \frac{22}{7}$. Explain why the two answers are different.

C2 The shape is a quarter of a circle with radius 6 cm. Work out its perimeter. Give your answer to 1 decimal place. [3 marks]

Answer ... cm

- C3** The shape is a square of side 10 cm with a semicircle on one side. Work out the perimeter of the shape. Give your answer to 1 decimal place. [3 marks]



- C4** A satellite moves in a circle of radius 6800 km round the centre of the Earth. How far does it travel in one orbit? Give your answer to the nearest 100 km. [2 marks]

Answer ... km

Answer ... cm

D Exam-style questions

GCSE Foundation

- D1** A trundle wheel is pushed along the ground to measure distances. The wheel moves forward exactly 1 metre for each complete turn.

- (a) Work out the diameter of the wheel in centimetres. Give your answer to 1 decimal place. [3 marks]

Answer ... cm

- (b) A different wheel has a diameter of 25 cm. It is pushed 20 m along a path. How many complete turns does it make? You must show your working. [3 marks]

Answer

Total for D1: 6 marks

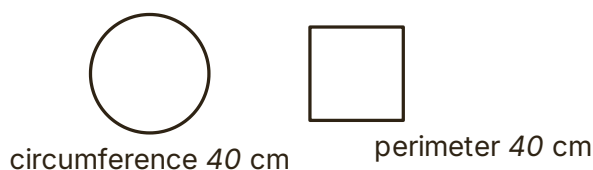
- D2** Ben works out the circumference of a circle with radius 5 cm. He writes:
 $\pi \times 5 = 15.7$ cm. [3 marks]

Explain Ben's mistake. Work out the correct circumference to 1 decimal place.

- D3** A baker ties a ribbon once round the side of a circular cake of diameter 24 cm. [4 marks]
Each ribbon needs an extra 4 cm for the knot. The baker needs ribbons for 5 cakes.
Ribbon is sold only in whole metres, and each metre costs £1.20. Work out the cost of the ribbon she must buy. You must show your working.

Answer £ ...

- D4** A circle has a circumference of 40 cm. A square has a perimeter of 40 cm. Which is [4 marks]
longer, the diameter of the circle or a side of the square? By how much? Give your
answer to 1 decimal place.



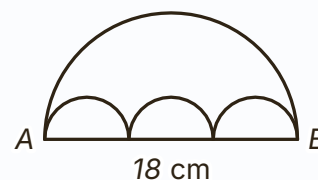
Not drawn accurately

E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** AB is the diameter of a large semicircle. $AB = 18$ cm. Three equal small [3 marks]
semicircles also sit on AB , side by side. Which is longer: the path along the
curved edge of the large semicircle, or the path along the curved edges of the
three small ones? Give both lengths to 1 decimal place.



Answer ... cm and ... cm

Not drawn accurately

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Each small semicircle has a diameter of $18 \div 3$.
Hint 2 Large curve: $\pi \times 18 \div 2$. One small curve: $\pi \times 6 \div 2$.
Hint 3 Large: 28.3 cm. Small: $3 \times 9.42 \dots = 28.3$ cm. They are
the same length.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can use $C = \pi d$ and $C = 2\pi r$ to [] [] []
work out a circumference.

I can work out the perimeter of a [] [] []
semicircle or a quarter circle.

I can work out a diameter or a radius [] [] []
from a circumference.