

Formula for the area of a circle

Year 7 About 75 minutes Calculator allowed 46 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-formula-for-the-area-of-a-circle/

Date _____

A Do Now

Quick questions to start.

A1 Needed today

[1 mark]

Work out 3.5^2 .

Answer

A2 Last lesson

[1 mark]

A circle has a diameter of 11 cm.
 Work out its circumference to 1 decimal place.

Answer

A3 Needed today

[1 mark]

Work out the area of a rectangle
 7.5 cm long and 4 cm wide.

Answer

A4 From chapter 1

[1 mark]

Work out $\sqrt{196}$.

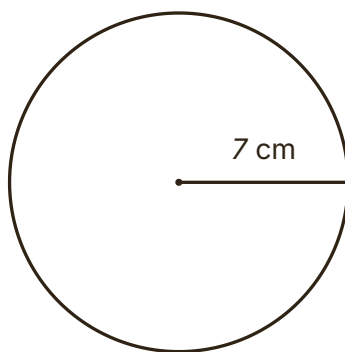
Answer

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**

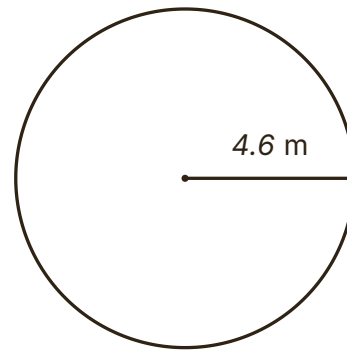
Work out the area of the circle. Give your answer to 1 decimal place.



Hint $A = \pi r^2$. Square the radius first, then multiply by π .

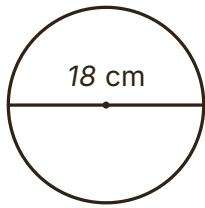
B1 Work out the area of the circle. [2 marks]

Give your answer to 1 decimal place.

Answer ... m²

EXAMPLE 2

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



Hint The line across the circle is a diameter. Halve it to get the radius.

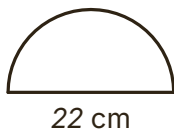
EXAMPLE 3

A circle has a radius of 11 cm. Work out its area. Give your answer in terms of π .

Hint "In terms of π " means leave π in the answer. Do not multiply it out.

EXAMPLE 4

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



Hint A semicircle is half of a circle. Work out the area of the whole circle, then halve it.

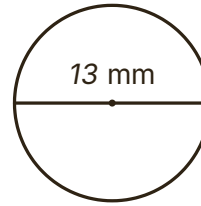
EXAMPLE 5

The area of a circle is 50 cm^2 . Work out its radius. Give your answer to 1 decimal place.

Hint $\pi r^2 = 50$, so $r^2 = 50 \div \pi$. Then take the square root.

B2 Work out the area of the circle. [2 marks]

Give your answer to 1 decimal place.

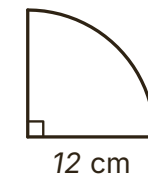


Answer ... mm^2

B3 Work out the area of each circle. Give your answers in terms of π . [2 marks]

(a) A circle with radius 9 cm. (b) A circle with diameter 30 cm.

B4 The shape is a quarter of a circle. Work out its area. Give your answer to 1 decimal place. [2 marks]



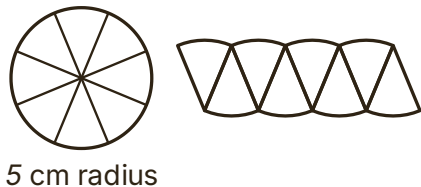
Answer ... cm^2

B5 The area of a circle is 120 m^2 . [3 marks]

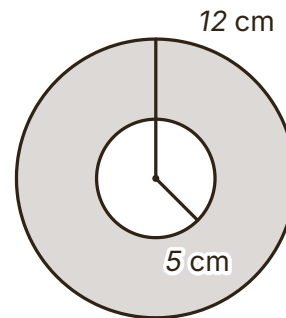
Work out its radius. Give your answer to 1 decimal place.

Answer ... m

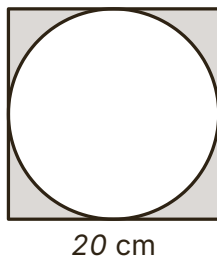
- C1** A circle of radius 5 cm is cut into 8 equal sectors. They are laid side by side to make a shape close to a rectangle. The long side is half of the circumference. The short side is the radius. Work out the long side and the area, each to 1 decimal place. [3 marks]



- C2** The shaded shape is a ring between two circles with the same centre. The radii are 12 cm and 5 cm. Work out the area of the ring. Give your answer to 1 decimal place. [3 marks]



- C3** A circle fits exactly inside a square of side 20 cm. Work out the total area of the four shaded corners. Give your answer to 1 decimal place. [3 marks]



- C4** A circular pond has a diameter of 9.4 m. Work out the area of the pond to the nearest square metre. [2 marks]

Answer ... cm²

Answer ... m²

Answer ... cm²

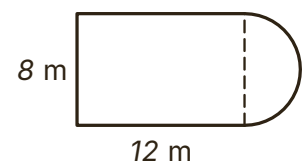
- D1** Lily works out the area of a circle with diameter 26 cm. She writes: [3 marks]
 $\pi \times 26^2 = 2123.7 \text{ cm}^2$.

Explain Lily's mistake. Work out the correct area to 1 decimal place.

- D2** A small pizza has a diameter of 20 cm and costs £6. A large pizza has a diameter of 30 cm and costs £12. Which pizza gives more pizza for each pound? You must show your working. [5 marks]

- D3** A lawn is a rectangle 12 m by 8 m with a semicircle on one 8 m side.

- (a) Work out the area of the lawn. Give your answer to 1 decimal place. [3 marks]



Not drawn accurately

Answer ... m²

- (b) One box of grass seed covers 25 m². How many boxes are needed to cover the lawn? [2 marks]

Answer

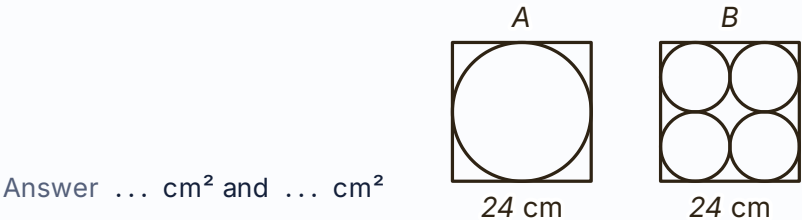
Total for D3: 5 marks

- D4** A café has 6 round table tops, each with a radius of 0.6 m. Each top needs 2 coats of varnish. One tin of varnish covers 3 m². How many tins are needed? You must show your working. [4 marks]

Answer ... tins

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

E1 Two square sheets of card each have side 24 cm. From sheet *A* one circle is cut, [3 marks] as large as possible. From sheet *B* four equal circles are cut, as large as possible. Which sheet has more card left over? Give the area left on each sheet to 1 decimal place.



Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** On sheet *A* the circle has radius 12 cm. On sheet *B* each circle has radius 6 cm.
- Hint 2** Area of the square: $24 \times 24 = 576$. Take away the circles on each sheet.
- Hint 3** *A*: $576 - \pi \times 12^2 = 123.6$. *B*: $576 - 4 \times \pi \times 6^2 = 123.6$. They are the same.

How did it go?

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

- I can use $A = \pi r^2$ to work out the area of a circle. ○ ○ ○
-
- I can work out an area from a diameter, or leave it in terms of π . ○ ○ ○
-
- I can work out the area of a semicircle, a ring or a compound shape. ○ ○ ○
-
- I can work out a radius from an area. ○ ○ ○