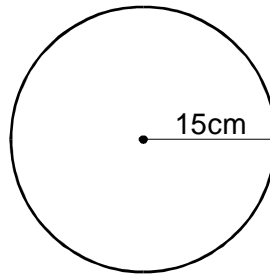


SAT TOPIC SHEET

CIRCLES

1. a) A circle has a radius of 15cm.



Calculate the **area** of the circle. Show your working.

- b) A different circle has a **circumference** of **120cm**.
What is the **radius** of the circle? Show your working.

(level 6)

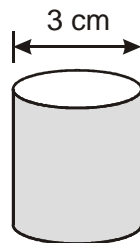
2. A trundle wheel is used to measure distances.
Imran makes a trundle wheel, of **diameter 50cm**.



- a) Calculate the **circumference** of Imran's trundle wheel. Show your working.
- b) Imran uses his trundle wheel to measure the length of the school car park.
His trundle wheel rotates **87 times**.
What is the **length** of the car park, to the **nearest metre**?

(level 6)

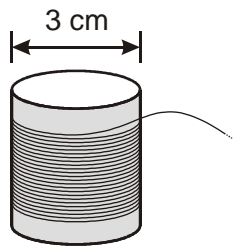
3. a) The cross-section of a cylindrical cotton reel is a circle.



The **diameter** of this circle is **3 cm**.

What is the **circumference** of this circle?

- b) **91 metres** of cotton goes round the cotton reel.



About how many times does the cotton go round the reel?
Show your working, and give your answer to the **nearest ten**.

(level 6)

4. A circular table has **diameter 5.5 metres**. It is claimed that 50 people can sit around the table.

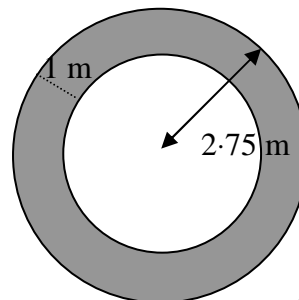
Assume that each person needs 45 cm around the circumference of the table.

Is it possible for 50 people to sit around the table. **Show your working**.

(level 6)

5. A circular pond is surrounded by a circular lawn of width 1 m as shown in the diagram.

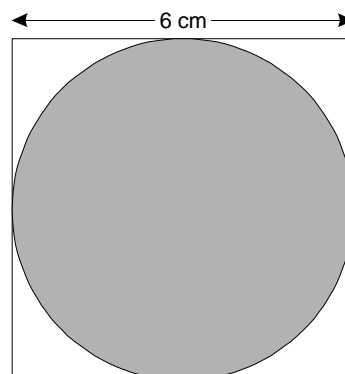
Calculate the area of the lawn.



(level 7)

6. The diagram shows a square and a circle.
The circle touches the edges of the square.

What **percentage** of the diagram is shaded?
Show your working.



(level 7)

Solutions.

1. a) Area = $\pi \times r^2 = \pi \times 15^2 = 706.8583471 \text{ cm}^2$.
b) Circumference = $\pi \times \text{diameter} = 120$
which means diameter = $\frac{120}{\pi} = 38.19718634 \text{ cm}$.
Thus, radius = $38.19718634 \div 2 = 19.09859317 \text{ cm}$.
2. a) Circumference = $\pi \times \text{diameter} = \pi \times 50 = 157.0796327 \text{ cm}$.
b) $87 \times 157.0796327 \text{ cm} = 13665.92804 \text{ cm}$.
Convert to metres by dividing by 100 to give the answer 137 metres.
3. a) Circumference = $\pi \times \text{diameter} = \pi \times 3 = 9.424777961 \text{ cm}$.
b) Because of part a), we are better off working in centimetres.
91 metres = 9100 cm.
Answer = $\frac{9100}{9.424777961} = 965.53\dots$ or 970 times to the nearest 10.
4. Table circumference = $\pi \times \text{diameter} = \pi \times 5.5 = 17.27875959 \text{ metres}$.

50 people require $50 \times 45 \text{ cm} = 2250 \text{ cm}$ or 22.5 metres.

There is thus insufficient room around the table.
5. Area of large circle = $\pi \times r^2 = \pi \times 2.75^2 = 23.75829444 \text{ m}^2$.
Area of small circle = $\pi \times r^2 = \pi \times 1.75^2 = 9.621127502 \text{ m}^2$.

Answer = $23.75829444 - 9.621127502 = 14.13716694 \text{ m}^2$.
6. Total area of square = $6^2 = 36 \text{ cm}^2$.

Shaded area = $\pi \times r^2 = \pi \times 3^2 = 28.27433388 \text{ cm}^2$.

% shaded area = $\frac{28.27433388}{36} \times 100 = 78.5\%$.