



Grade 8 - Mathematics

Measurement 6

Memo



1. Calculate the area of a circle with a radius of 25mm.

$$\begin{aligned} A &= \pi r^2 \\ &= 3,14 \times (25\text{mm})^2 \\ &= 3,14 \times 625\text{mm}^2 \\ &= 1962,5\text{mm}^2 \end{aligned}$$

2. Calculate the area of a circle with a diameter of 6cm.

$$\begin{aligned} d &= 6\text{cm} & r &= 3\text{cm} \\ A &= \pi r^2 \\ &= 3,14 \times (3\text{cm})^2 \\ &= 3,14 \times 9\text{cm}^2 \\ &= 28,26\text{cm}^2 \end{aligned}$$

3. Complete the following table.

	Radius	Diameter	Area
a.	3,5km	7km	38,47km ²
b.	6,5cm	13cm	132,67cm ²
c.	7m	14m	153,86m ²

$$\begin{aligned} \text{a. } A &= \pi r^2 \\ &= 3,14 \times (3,5\text{km})^2 \\ &= 3,14 \times 12,25\text{km}^2 \\ &= 38,47\text{km}^2 \end{aligned}$$

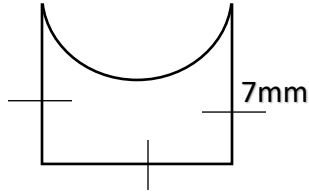
$$\begin{aligned} \text{b. } A &= \pi r^2 \\ &= 3,14 \times (6,5\text{cm})^2 \\ &= 3,14 \times 42,25\text{cm}^2 \\ &= 132,67\text{cm}^2 \end{aligned}$$

$$\begin{aligned} \text{c. } A &= \pi r^2 \\ &= 3,14 \times (7\text{m})^2 \\ &= 3,14 \times 49\text{m}^2 \\ &= 153,86\text{m}^2 \end{aligned}$$



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4. Calculate the area of the following shape:



A of shape = A of square - $\frac{1}{2}$ A of circle

$$\begin{aligned} \text{A of Square} &= s \times s \\ &= 7\text{mm} \times 7\text{mm} \\ &= 49\text{mm}^2 \end{aligned}$$

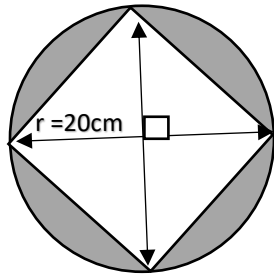
$$\begin{aligned} \frac{1}{2}\text{A of circle} &= \frac{1}{2}(\pi r^2) \\ &= \frac{1}{2} [3,14 \times (3,5\text{mm})^2] \\ &= \frac{1}{2} [3,14 \times 12,25\text{mm}^2] \\ &= \frac{1}{2} [38,47\text{mm}^2] \\ &= 19,24\text{mm}^2 \end{aligned}$$

$$\begin{aligned} \text{A of shape} &= 49\text{mm}^2 - 19,24\text{mm}^2 \\ &= 29,76\text{mm}^2 \end{aligned}$$



WorksheetCloud

5. Calculate the area of the shaded part in the following diagram:



A of shaded part = A of circle – A of square

$$\begin{aligned} \text{A of circle} &= \pi r^2 \\ &= 3,14 \times (20\text{cm})^2 \\ &= 3,14 \times 400\text{cm}^2 \\ &= 1\,256\text{cm}^2 \end{aligned}$$

$$\begin{aligned} \text{A of square} &= s \times s \\ \text{s of square: } h^2 &= s^2 + s^2 \text{ (pythag)} \\ h^2 &= (20)^2 + (20)^2 \\ h^2 &= 400 + 400 \\ h^2 &= 800 \\ h &= \sqrt{800} \\ h &= 28,28 \end{aligned}$$

$$\begin{aligned} \text{A of square} &= 28,28\text{cm} \times 28,28\text{cm} \\ &= 799,76\text{cm}^2 \end{aligned}$$

$$\begin{aligned} \text{A of shaded part} &= 1\,256\text{cm}^2 - 799,76\text{cm}^2 \\ &= 456,24\text{cm}^2 \end{aligned}$$

6. Which table has a greater area: a rectangular table of 1,6m by 1,2m or a circular table with a radius of 84cm?

Rectangular table:

$$\begin{aligned} \text{A} &= l \times b \\ &= 1,6\text{m} \times 1,2\text{m} \\ &= 1,92\text{m}^2 \end{aligned}$$

Circular table:

$$\begin{aligned} \text{A} &= \pi r^2 \\ &= 3,14 \times (0,84\text{m})^2 \\ &= 3,14 \times 0,71\text{m}^2 \\ &= 2,23\text{m}^2 \end{aligned}$$

The circular table has the greater area.