Area and Circumference of a Circle

Area = \pi r^2 \quad [NB \text{ do } r^2 \text{ first, then } \times \pi] \\
Circ = \pi d

Examples

1. Find the circumference and area of this circle

   \[ C = \pi \times 12 = 37.7\text{cm (1dp)} \]

   \[ A = \pi \times 6^2 = 113.1\text{cm}^2(1dp) \]

2. The circumference of a circle is 100cm. What is its diameter?

   \[ \pi d = 100 \]

   \[ d = \frac{100}{\pi} \]

   \[ = 31.8\text{cm (1dp)} \]
A cycle wheel has a diameter of 60 cm. How many times does it turn in a journey of 1 km?

\[ C = \pi \times 60 \]
\[ = 188.5 \text{ cm}. \]

So the wheel moves forward 188.5 cm for each turn that it makes.

To travel 1 km, which is 1000 m or 100 000 cm

So in 1 km the wheel turns \[ \frac{100000}{188.5} = 530.5 \text{ times} \]
Find the area and perimeter of this shape.

Area of rectangle = \( 7 \times 10 = 70 \text{ cm}^2 \)

Area of semicircle = \( \frac{1}{2} \times \pi \times 5^2 \) = 39.3 cm²

Total area = \( 109.3 \text{ cm}^2 \) (70 + 39.3)

Perimeter of semicircle = \( \frac{1}{2} \times \pi \times 10 \) = 15.7 cm

Total perimeter = 15.7 + 7 + 10 + 7 = 39.7 cm

A circle has an area of 100 cm². Find its radius.

\[
\pi r^2 = 100
\]

\[
r^2 = \frac{100}{\pi}
\]

\[
r = \sqrt{\frac{100}{\pi}}
\]

\[
= 5.64 \text{ cm}
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