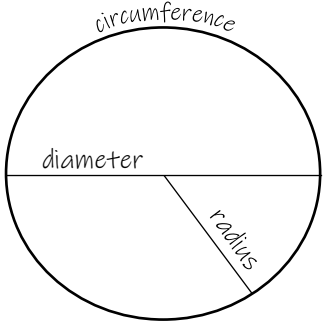


Y8 Maths Knowledge Organiser Topic 10: Circles

What must I be able to do?	Key vocabulary										
New content: <ul style="list-style-type: none"> □ Be able to name the key parts of a circle <ul style="list-style-type: none"> ➤ Sparx M595 □ Use the formula to calculate the circumference of a circle <ul style="list-style-type: none"> ➤ Sparx M169 □ Use the formula to calculate the area of a circle <ul style="list-style-type: none"> ➤ Sparx M231 □ Find the area and perimeter of fractions of a circle, including a semicircle and a quarter circle 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Circumference</td> <td style="padding: 5px;">The <u>distance</u> around the <u>outside</u> of a circle.</td> </tr> <tr> <td style="padding: 5px;">Radius</td> <td style="padding: 5px;">The <u>distance</u> from the <u>centre</u> of a circle <u>to the circumference</u>.</td> </tr> <tr> <td style="padding: 5px;">Diameter</td> <td style="padding: 5px;">The <u>distance across</u> a circle, going <u>through the centre</u>.</td> </tr> <tr> <td style="padding: 5px;">Semicircle</td> <td style="padding: 5px;"><u>Half</u> of a full <u>circle</u>.</td> </tr> <tr> <td style="padding: 5px;">π</td> <td style="padding: 5px;">The Greek letter pi. Used to represent the never ending number 3.141592654..... Most calculators will have a π button.</td> </tr> </table>	Circumference	The <u>distance</u> around the <u>outside</u> of a circle.	Radius	The <u>distance</u> from the <u>centre</u> of a circle <u>to the circumference</u> .	Diameter	The <u>distance across</u> a circle, going <u>through the centre</u> .	Semicircle	<u>Half</u> of a full <u>circle</u> .	π	The Greek letter pi. Used to represent the never ending number 3.141592654..... Most calculators will have a π button.
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Parts of a circle



The diameter is equal to twice the length of the radius:

$$d = 2r$$

Circumference of a circle

The circumference of a circle is equal to π multiplied by the diameter:

$$C = \pi d$$

Rearranging this gives us:

$$d = C \div \pi$$

As $d = 2r$ the circumference can also be written as:

$$C = 2\pi r$$

Area of a circle

The area of a circle is equal to π multiplied by the radius squared:

$$A = \pi r^2$$

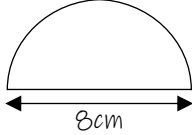
Note that just the r is squared, not π

Rearranging this gives us:

$$r = \sqrt{\frac{A}{\pi}}$$

Working with parts of circles

e.g.



Area of a semicircle:

The semicircle has a diameter of 8cm, so the radius is 4cm.

The area of a full circle: $\pi r^2 = \pi \times 4^2 = 50.265482.....$

So area of the semicircle = $50.265482..... \div 2 = 25.13 \text{ cm}^2$ (2d.p.)

Perimeter of a semicircle:

The circumference of a full circle: $\pi d = \pi \times 8 = 25.13274.....$

Circumference of the semicircle (curved edge only)


$$= 25.13274... \div 2 = 12.566.....$$

Total perimeter = $12.566... + 8 = 20.57 \text{ cm}$ (2d.p.)

↑

Perimeter includes the straight edge of the semicircle

e.g.



Area of a quarter circle:

The area of a full circle: $\pi r^2 = \pi \times 5^2 = 78.5398.....$

So area of a quarter is = $78.5398... \div 4 = 19.63 \text{ cm}^2$ (2d.p.)

Perimeter of a quarter circle:

The circumference of a full circle: $\pi d = \pi \times 10 = 31.4159.....$

Circumference of the quarter circle (curved edge only)

$$= 31.4159... \div 4 = 7.8539.....$$

↑

Plus the 2 straight sides

Total perimeter = $7.8539... + 5 + 5 = 17.85 \text{ cm}$ (2d.p.)