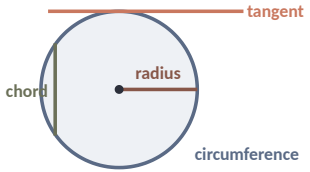
Circles: fact sheet

Planner week 12 · Learn these facts

Parts of a circle



Diameter = 2 × radius

Chord: edge to edge

Circumference

$$C = \pi \times d$$

d = 80 m: $80\pi = 251.3$ m

The distance round the edge

$C = 2 \times \pi \times r$

Area

$$A = \pi \times r^2$$

r = 10: $\pi \times 100 = 314.2$

Square the **radius** first

Units²

Semicircle

area = $\pi\ r^2 \div 2$

perimeter = $\pi\ d \div 2 + d$

Half the circle

Add the straight edge for perimeter

Quarter circle

area = $\pi\ r^2 \div 4$

perimeter = $\pi\ d \div 4 + 2r$

A quarter of the circle

Add two radii for perimeter

Rings

big circle − small circle

$\pi \times 7^2 - \pi \times 4^2 = 33\pi$

Take away the hole

Leave in π to compare

Estimating

$$\pi \approx 3$$

$3 \times 10^2 = 300$

Round π to 3 to estimate

π > 3, so it is an underestimate

Words

Chord	edge to edge
Tangent	touches outside
Arc	part of the edge
Sector	pizza slice
Segment	cut off by a chord

Which sheet do I need?

Parts of a circle ▸
name a part of a circle

Circumference ▸
the distance round: π × diameter

Area of a circle ▸
the space inside: $\pi \times r^2$

Key words

- **Radius** centre to the edge
- **Diameter** edge to edge through the centre
- **Circumference** the distance round
- **π** about 3.14, use the π button

Exam tips

- Check: are you given the radius or the diameter?
- Area uses r^2. Circumference uses d.
- Use the π button and round at the end.
- Semicircle perimeter: half the circumference **plus** the diameter.
- Compound shapes: split into pieces and add.
- "Show that": write every step.

Parts of a circle: fact sheet

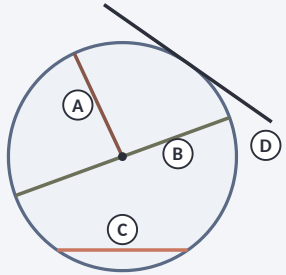
Circles · Planner week 12 · Learn the method

Worked example

QUESTION

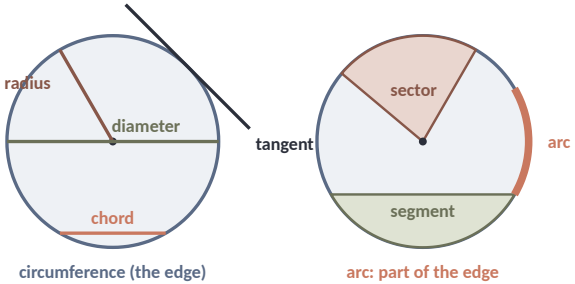
Here is a circle with centre O.

Write down the mathematical name of each line **A**, **B**, **C** and **D**.



ANSWER

1. **A** goes from the centre to the edge: **radius**
2. **B** goes edge to edge, through the centre: **diameter**
3. **C** goes edge to edge, **not** through the centre: **chord**
4. **D** touches the circle once, outside it: **tangent**



All the parts. Diameter = 2 × radius.

How to do it

1. Radius: centre to the edge.
2. Diameter: edge to edge through the centre (2 radii).
3. Chord: edge to edge, not through the centre.
4. Tangent: a straight line touching the outside.
5. Sector: between two radii. Segment: between a chord and the arc.

Model answer:

A radius, B diameter, C chord, D tangent

Watch out

- Calling a radius a diameter.
- Mixing up sector and segment.
- Drawing a chord through the centre (that is a diameter).

Circumference: fact sheet

Circles · Planner week 12 · Learn the method

Worked example

QUESTION

A circle has a diameter of 8 cm.
Work out the circumference of the circle. Give your answer to 1 decimal place.

ANSWER

1. Circumference = π × diameter
2. = π × 8 = 25.13...

25.1 cm

Circumference = π × diameter.

How to do it

1. Find the diameter (2 × radius).
2. Circumference = π × diameter.
3. Part of a circle: halve or quarter it.
4. Add any straight edges.
5. Round at the end.

Model answer:

π × 8 = 25.1 cm

Watch out

- Using the radius in π × d.
- Rounding too early.
- Forgetting the straight edge on a semicircle.

Area of a circle: fact sheet

Circles · Planner week 12 · Learn the method

Worked example

QUESTION

A circle has a radius of 6 cm.

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

ANSWER

1. Area = π × radius²
2. = π × 6^2 = π × 36
3. = 113.09…

113.1 cm²

Area = π × radius × radius.

How to do it

1. Find the radius (half the diameter).
2. Square the radius, then multiply by π.
3. Part of a circle: divide by 2, 4 …
4. Shaded areas: big shape − small shape.
5. Working back: area ÷ π, then square root.

Model answer:

π × 6^2 = 113.1 cm²

Watch out

- Working out $(\pi \times r)^2$ instead of $\pi \times r^2$.
- Using the diameter instead of the radius.
- Forgetting to divide for a semicircle.