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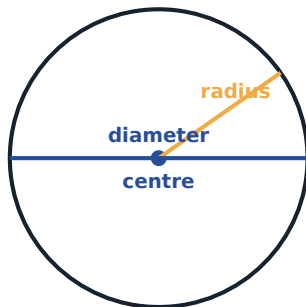
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8.2 The parts of a circle — worked answers

Name the parts of a circle and use the relationship between radius and diameter. · 47 questions

A · Fluency — Radius, diameter and the names.

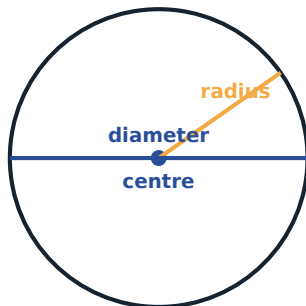
- 1 A circle has radius 3 cm. What is its diameter, in cm?



Answer: 6

The diameter is twice the radius: $2 \times 3 = 6$ cm.

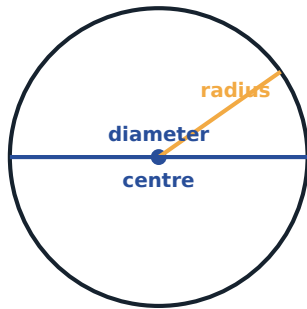
- 2 A circle has radius 5 cm. What is its diameter, in cm?



Answer: 10

The diameter is twice the radius: $2 \times 5 = 10$ cm.

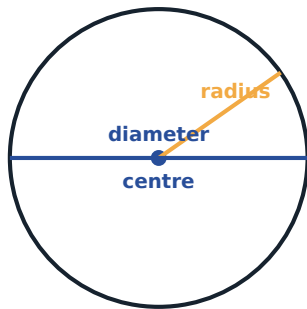
- 3 A circle has radius 8 cm. What is its diameter, in cm?



Answer: 16

The diameter is twice the radius: $2 \times 8 = 16$ cm.

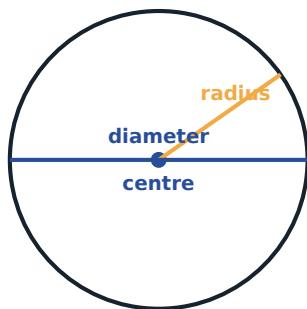
- 4 A circle has radius 10 cm. What is its diameter, in cm?



Answer: 20

The diameter is twice the radius: $2 \times 10 = 20$ cm.

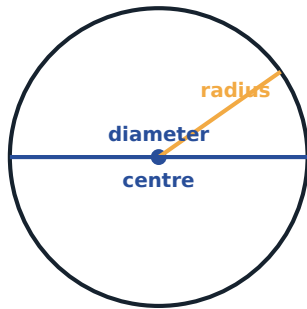
- 5 A circle has radius 12 cm. What is its diameter, in cm?



Answer: 24

The diameter is twice the radius: $2 \times 12 = 24$ cm.

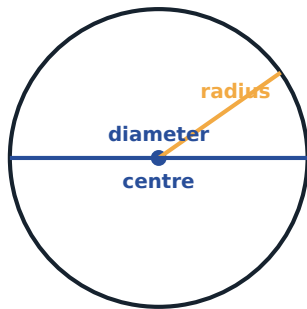
- 6 A circle has radius 25 cm. What is its diameter, in cm?



Answer: 50

The diameter is twice the radius: $2 \times 25 = 50$ cm.

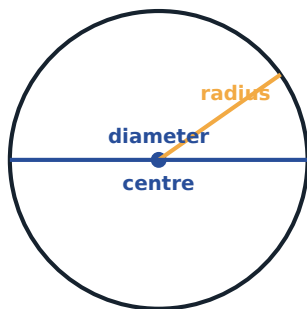
- 7 A circle has radius 40 cm. What is its diameter, in cm?



Answer: 80

The diameter is twice the radius: $2 \times 40 = 80$ cm.

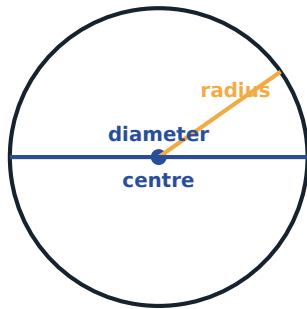
- 8 A circle has radius 7 cm. What is its diameter, in cm?



Answer: 14

The diameter is twice the radius: $2 \times 7 = 14$ cm.

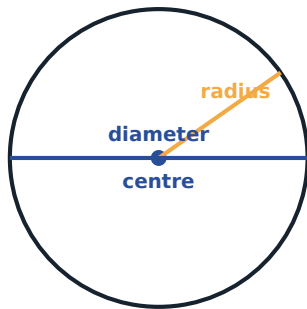
- 9 A circle has radius 15 cm. What is its diameter, in cm?



Answer: 30

The diameter is twice the radius: $2 \times 15 = 30$ cm.

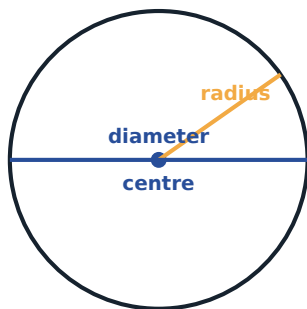
- 10 A circle has radius 50 cm. What is its diameter, in cm?



Answer: 100

The diameter is twice the radius: $2 \times 50 = 100$ cm.

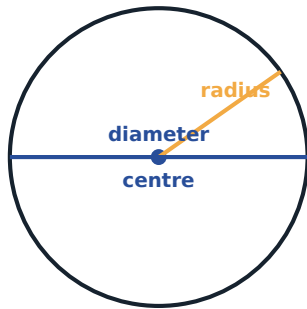
- 11 A circle has diameter 6 cm. What is its radius, in cm?



Answer: 3

The radius is half the diameter: $6 \div 2 = 3$ cm.

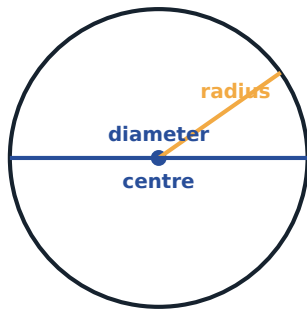
- 12** A circle has diameter 10 cm. What is its radius, in cm?



Answer: 5

The radius is half the diameter: $10 \div 2 = 5$ cm.

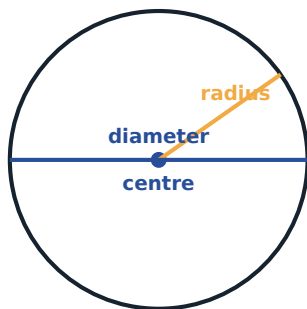
- 13** A circle has diameter 16 cm. What is its radius, in cm?



Answer: 8

The radius is half the diameter: $16 \div 2 = 8$ cm.

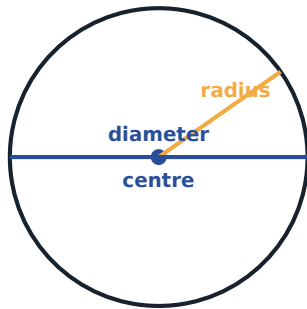
- 14** A circle has diameter 24 cm. What is its radius, in cm?



Answer: 12

The radius is half the diameter: $24 \div 2 = 12$ cm.

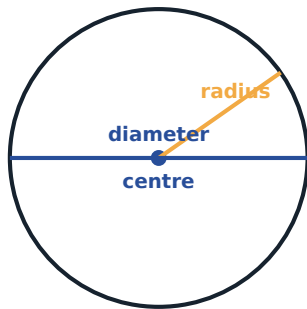
- 15** A circle has diameter 30 cm. What is its radius, in cm?



Answer: 15

The radius is half the diameter: $30 \div 2 = 15$ cm.

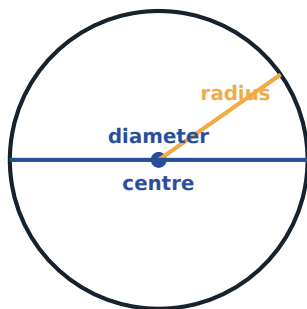
- 16** A circle has diameter 50 cm. What is its radius, in cm?



Answer: 25

The radius is half the diameter: $50 \div 2 = 25$ cm.

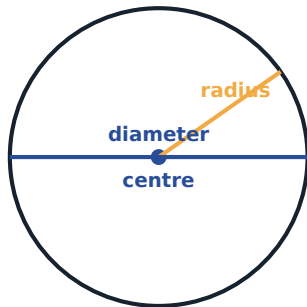
- 17** A circle has diameter 14 cm. What is its radius, in cm?



Answer: 7

The radius is half the diameter: $14 \div 2 = 7$ cm.

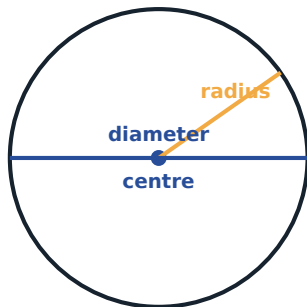
- 18 A circle has diameter 44 cm. What is its radius, in cm?



Answer: 22

The radius is half the diameter: $44 \div 2 = 22$ cm.

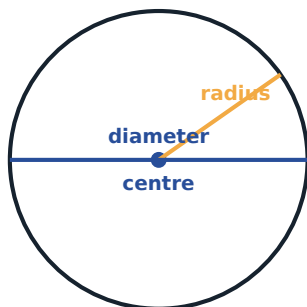
- 19 A circle has diameter 100 cm. What is its radius, in cm?



Answer: 50

The radius is half the diameter: $100 \div 2 = 50$ cm.

- 20 A circle has diameter 8 cm. What is its radius, in cm?



Answer: 4

The radius is half the diameter: $8 \div 2 = 4$ cm.

- 21 Which part of a circle is *the distance from the centre to the edge*?

Answer: radius

That is the **radius**.

- 22 Which part of a circle is *the distance right across through the centre*?

Answer: diameter

That is the **diameter**.

- 23 Which part of a circle is *the distance all the way round the outside*?

Answer: circumference

That is the **circumference**.

- 24 Which part of a circle is *the exact middle of the circle*?

Answer: centre

That is the **centre**.

- 25 Which part of a circle is *a straight line from one point on the circle to another, through the centre*?

Answer: diameter

That is the **diameter**.

- 26 Which part of a circle is *part of the circumference*?

Answer: arc

That is the **arc**.

B · Reasoning — How the parts relate.

- 27 How are the radius and the diameter related?

- ☐ They are equal
- ☐ The diameter is twice the radius
- ☐ The radius is twice the diameter
- ☐ They are unrelated

Answer: The diameter is twice the radius

A diameter is two radii laid end to end through the centre.

- 28 What is the circumference of a circle?

- ☐ The distance across it
- ☐ The distance all the way round it
- ☐ The area inside it
- ☐ Half the diameter

Answer: The distance all the way round it

It is the perimeter of a circle, given its own name.

- 29 How many lines of symmetry does a circle have?

- ☐ 1
- ☐ 2
- ☐ 4
- ☐ Infinitely many

Answer: Infinitely many

Every line through the centre is a line of symmetry.

30 What is the order of rotational symmetry of a circle?

- ☐ 1
- ☐ 2
- ☐ 4
- ☐ Infinite

Answer: Infinite

Any rotation about the centre maps the circle onto itself.

31 Is every diameter also a chord?

- ☐ Yes
- ☐ No

Answer: Yes

A chord joins two points on the circle; the diameter is the longest chord, the one through the centre.

32 Is every chord also a diameter?

- ☐ Yes
- ☐ No

Answer: No

Only the chords that pass through the centre are diameters.

33 A circle has radius r . What is the distance from one side to the other through the centre?

- ☐ r
- ☐ $2r$
- ☐ $r \div 2$
- ☐ $4r$

Answer: $2r$

That distance is the diameter.

34 Why does every circle have infinitely many lines of symmetry?

- ☐ Because it is round
- ☐ Because every line through the centre splits it into two matching halves
- ☐ Because it has no corners
- ☐ It does not

Answer: Because every line through the centre splits it into two matching halves

There are infinitely many such lines.

C · Challenge — Circles that touch and fit.

35 A circle has diameter 18 cm. A second circle has a radius equal to that diameter. What is the second circle's diameter, in cm?

Answer: 36

Its radius is 18 cm, so its diameter is 36 cm.

36 Two circles of radius 7 cm sit side by side, touching. How far apart are their centres, in cm?

Answer: 14

One radius from each centre to the touching point: $7 + 7 = 14$ cm.

37 A circle of radius 9 cm sits exactly inside a square. What is the side of the square, in cm?

Answer: 18

The square's side equals the circle's diameter: $2 \times 9 = 18$ cm.

- 38** Four circles of radius 5 cm fit in a row inside a rectangle, each touching the next. How long is the rectangle, in cm?

Answer: 40

Four diameters: $4 \times 10 = 40$ cm.

- 39** A circular pond of diameter 12 m has a path 1 m wide all round it. What is the diameter of the outer edge of the path, in m?

Answer: 14

The path adds 1 m on each side: $12 + 1 + 1 = 14$ m.

D · Word problems — Wheels, plates and ponds.

- 40** A bicycle wheel has radius 35 cm. What is its diameter, in cm?

Answer: 70

$2 \times 35 = 70$ cm.

- 41** A dinner plate has diameter 26 cm. What is its radius, in cm?

Answer: 13

$26 \div 2 = 13$ cm.

- 42** A circular table has radius 60 cm. How wide is it across, in cm?

Answer: 120

The width across is the diameter: $2 \times 60 = 120$ cm.

- 43** A coin has diameter 24 mm. What is its radius, in mm?

Answer: 12

$24 \div 2 = 12$ mm.

- 44** A roundabout has diameter 30 m. How far is it from the centre to the edge, in m?

Answer: 15

That is the radius: $30 \div 2 = 15$ m.

- 45** A clock face has radius 11 cm. What is the distance from the 12 to the 6, in cm?

Answer: 22

Straight through the centre: the diameter, $2 \times 11 = 22$ cm.

- 46** A gardener walks all the way round a circular lawn. Which part of the circle has he walked?

Answer: circumference

The distance round the outside is the circumference.

- 47** A pizza is cut straight through the middle. What is the name of that cut?

Answer: diameter

A straight line through the centre from edge to edge.