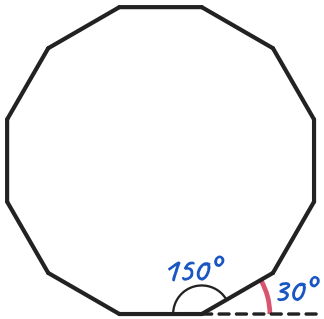
Angles in regular polygons

ANSWERS

1

A regular dodecagon has 12 sides.
Find the exterior angle and the interior angle.

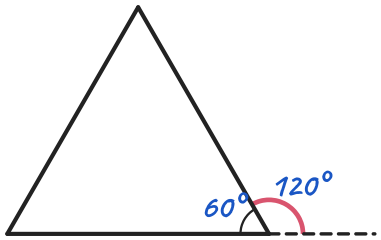


exterior angle 360° ÷ 12 = 30°

interior angle 180° − 30° = 150°

2

An equilateral triangle is a regular polygon with 3 sides. Find the exterior angle and the interior angle.

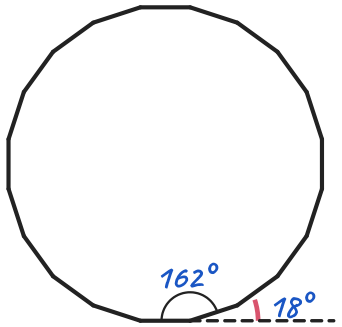


exterior angle 360° ÷ 3 = 120°

interior angle 180° − 120° = 60°

3

This is a regular polygon with 20 sides.
Find the exterior angle and the interior angle.

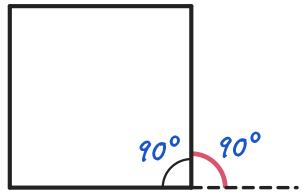


exterior angle 360° ÷ 20 = 18°

interior angle 180° − 18° = 162°

4

A square is a regular polygon with 4 sides.
Find the exterior angle and the interior angle.



exterior angle 360° ÷ 4 = 90°

interior angle 180° − 90° = 90°

5

Each exterior angle of a regular polygon is 20°. How many sides does it have?



360° ÷ 20° = 18

Sides: 18

6

Jas says each interior angle of a regular polygon with 36 sides is 360° ÷ 36 = 10°.
Explain what Jas has done wrong.
Then find the interior angle.



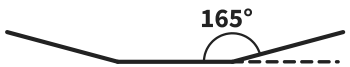
10° is the exterior angle

180° − 10° = 170°

Interior angle: 170°

7

Each interior angle of a regular polygon is 165°. How many sides does it have?



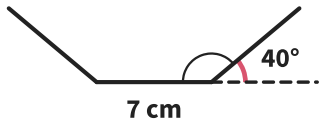
exterior angle 180° − 165° = 15°

360° ÷ 15° = 24

Sides: 24

8

Each exterior angle of a regular polygon is 40°. Each side is 7 cm long.
Work out its perimeter.



sides 360° ÷ 40° = 9

perimeter 9 × 7 = 63 cm

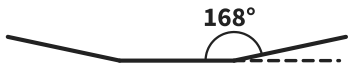
Perimeter: 63 cm

Angles in regular polygons *further practice*

ANSWERS

9

Each interior angle of a regular polygon is 168°. How many sides does it have?



exterior angle 180° – 168° = 12°

360° ÷ 12° = 30

Answer 30 sides

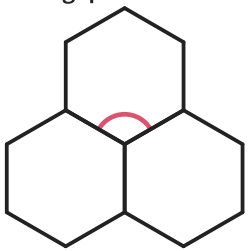
10

Each row of the table is a regular polygon. Complete the table.

Number of sides	Exterior angle	Interior angle
6	60°	120°
9	40°	140°
12	30°	150°

11

Floor tiles are regular hexagons. Show that three tiles fit together at a point with no gap.



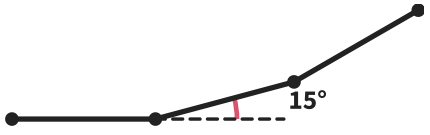
interior angle 180° – 60° = 120°

120° + 120° + 120° = 360°, a full turn

Answer 120° × 3 = 360°

12

A toy train track is a loop of straight pieces. At every join, it turns through 15°. The loop is a regular polygon. How many straight pieces are there?



the turn is the exterior angle

360° ÷ 15° = 24

Answer 24 pieces

13

Can a regular polygon have an interior angle of 130°? Explain how you know.

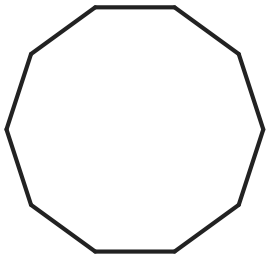
exterior angle 180° – 130° = 50°

360° ÷ 50° = 7.2, not whole

Answer No

14

Work out the sum of the interior angles of a regular polygon with 10 sides in two different ways.



(10 – 2) × 180° = 1440°

10 × 144° = 1440°

Answer 1440°

15

A pond is a regular polygon. Each interior angle is 144°. One edging stone 80 cm long fits each side. How long is the edging all the way round, in metres?

180° – 144° = 36°, 360° ÷ 36° = 10 sides

10 × 80 cm = 800 cm = 8 m

Answer 8 m

16

Explain why no regular polygon can have an exterior angle bigger than 120°.

fewest sides 3: 360° ÷ 3 = 120°

more sides make smaller turns

Answer 3 sides gives 120°