

# Angles and Polygons

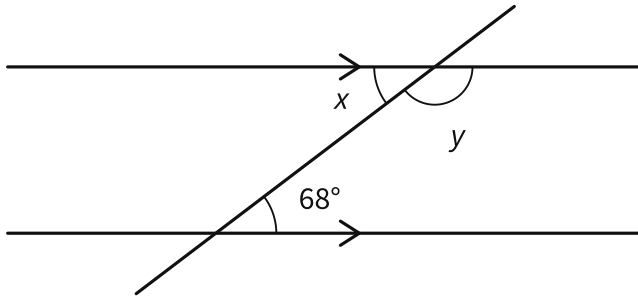
ANSWERS

Calculator | 30 minutes | Total marks: 29

Name .....

Class .....

- 1 The diagram shows two parallel lines crossed by a straight line.



Not drawn accurately

- (a) Write down the size of angle  $x$ .  
Give a reason for your answer.

$$x = 68 \text{ (1)}^\circ$$

*Alternate angles are equal (1)*

[2 marks]

- (b) Work out the size of angle  $y$ .  
Give a reason for your answer.

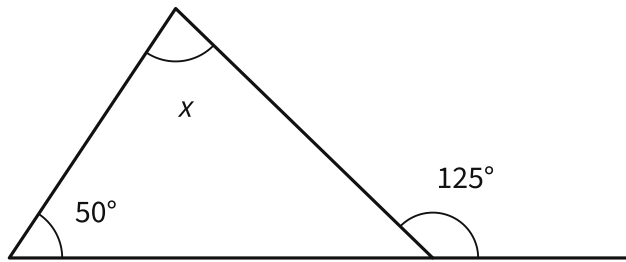
$$y = 112 \text{ (1)}^\circ$$

*Co-interior angles add up to  $180^\circ$  (1)*

[2 marks]

2

One side of the triangle has been extended.



Not drawn accurately

Work out the size of angle  $x$ .

$$125 - 50 \text{ (1)}$$

$$x = \underline{75 \text{ (1)}}^\circ \text{ [2 marks]}$$

3

Three angles of a quadrilateral are  $95^\circ$ ,  $110^\circ$  and  $70^\circ$ .

Work out the size of the fourth angle.

$$360 - 95 - 110 - 70 \text{ (1)}$$

$$\text{Answer } \underline{85 \text{ (1)}}^\circ \text{ [2 marks]}$$

4

(a) Work out the sum of the interior angles of a hexagon.

$$4 \times 180 \text{ (1)}$$

$$\text{Answer } \underline{720 \text{ (1)}}^\circ \text{ [2 marks]}$$

(b) Work out the size of each interior angle of a regular nonagon (9 sides).

$$360 \div 9 = 40 \text{ (1)}$$

$$\text{Answer } \underline{140 \text{ (1)}}^\circ \text{ [2 marks]}$$

(c) Work out the size of each exterior angle of a regular polygon with 20 sides.

$$\text{Answer } \underline{18 \text{ (1)}}^\circ \text{ [1 mark]}$$

(d) Each exterior angle of a regular polygon is  $40^\circ$ .

Work out the number of sides.

$$360 \div 40 \text{ (1)}$$

$$\text{Answer } \underline{9 \text{ (1)}} \text{ [2 marks]}$$

5

Each interior angle of a regular polygon is  $156^\circ$ .

Work out the number of sides of the polygon.

$$\text{exterior angle} = 180 - 156 = 24 \text{ (1)}$$

$$360 \div 24 \text{ (1)}$$

Answer 15 (1)

[3 marks]

6

(a) The bearing of  $B$  from  $A$  is  $070^\circ$ .

Work out the bearing of  $A$  from  $B$ .

$$70 + 180 \text{ (1)}$$

Answer 250 (1)

°

[2 marks]

(b) A ship sails on a bearing of  $130^\circ$ .

Write down the bearing it must sail on to return the way it came.

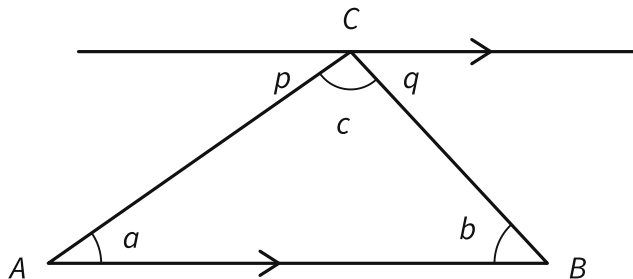
Answer 310 (1)

°

[1 mark]

7

The line through  $C$  is parallel to  $AB$ .



Use the diagram to prove that the angles in a triangle add up to  $180^\circ$ .

$$p = a \text{ because alternate angles are equal (1)}$$

$$q = b \text{ because alternate angles are equal (1)}$$

$$p + c + q = 180 \text{ on a straight line, so } a + b + c = 180 \text{ (1)}$$

[3 marks]

8

Explain why regular pentagons do not tessellate.

$$\text{Each interior angle is } 108^\circ \text{ (1)}$$

$$360 \div 108 \text{ is not a whole number, so they leave a gap at a point (1)}$$

[2 marks]

9

The angles of a pentagon are  $x$ ,  $2x$ ,  $100^\circ$ ,  $120^\circ$  and  $(3x - 40)^\circ$ .

Work out the value of  $x$ .

*angles add up to 540 (1)*

*$6x + 180 = 540$  (1)*

$x = 60$  (1)

[3 marks]

| Question | Topic                                                | RAG |
|----------|------------------------------------------------------|-----|
| 1        | I can use angles in parallel lines and give reasons  |     |
| 2        | I can use the exterior angle of a triangle           |     |
| 3        | I can find angles in a quadrilateral                 |     |
| 4        | I can use interior and exterior angles of polygons   |     |
| 5        | I can find the number of sides of a regular polygon  |     |
| 6        | I can work with bearings and return bearings         |     |
| 7        | I can prove the angle sum of a triangle              |     |
| 8        | I can explain why a shape does not tessellate        |     |
| 9        | I can form and solve an equation with polygon angles |     |