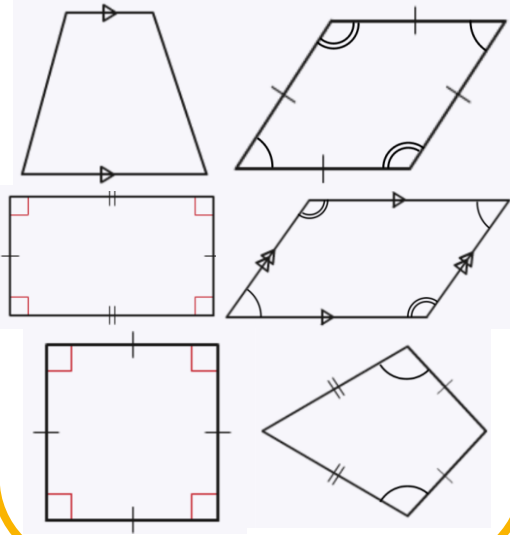


# Year 8 Knowledge Organiser

## PROPERTIES OF SHAPES

### Key Concept Quadrilaterals



### Key Words

**Angle:** This is formed by two lines, joined by a common endpoint.

**Symmetry:** A shape has symmetry if there is a line which forms two equal parts which are a mirror image of each other.

**Reflection:** This is where a shape is flipped.

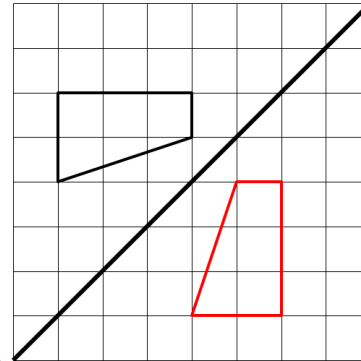
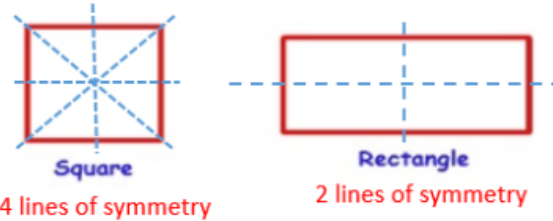
**Rotation:** This is where a shape is turned.

### Tip

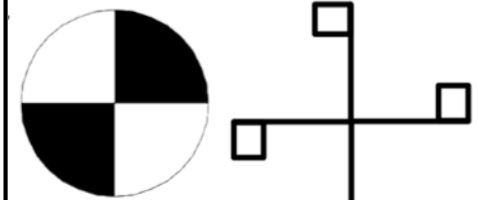
- The smallest the order of rotational symmetry can be, is 1.
- To see if a line of symmetry works fold along the line and see if the both halves lie exactly on top of each other.

### Examples

#### Lines of symmetry and reflection



#### Rotational Symmetry



Order = 2

Order = 4

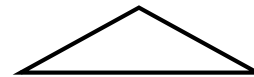
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Clip Numbers  
457-460, 639-649,  
822-828

**Questions** - For the shapes below draw on their lines of symmetry and state their order of rotational symmetry.

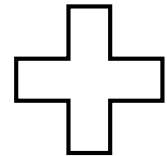
1)



2)



3)

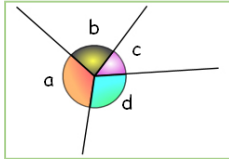
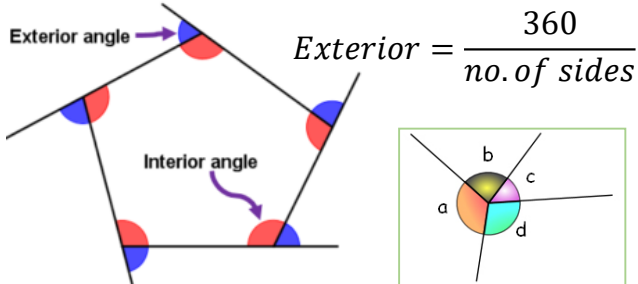


ANSWERS: 1) 2 lines of symmetry, order = 2 2) 1 line of symmetry, order = 1 3) 4 lines of symmetry, order = 4.

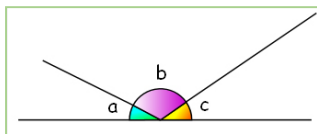
# Year 8 Knowledge Organiser

## ANGLE PROPERTIES

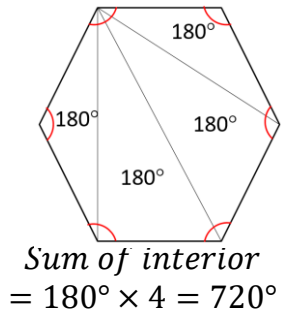
### Key Concepts



Angles at a point add to  $360^\circ$



Angles on a line add to  $180^\circ$



### Key Words

**Angle:** This is formed by two lines joined by a common endpoint.

**Quadrilateral:** 4 sided shape.

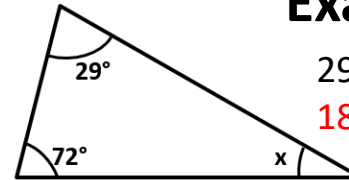
**Polygon:** Many sided shape.

**Regular polygon:** All sides and angles are equal.

**Interior angle:** The angle inside a polygon.

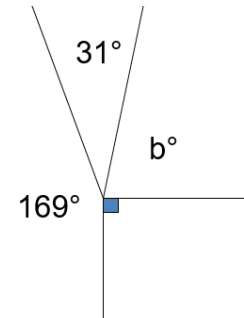
**Exterior angle:** The angle formed when a side length of a polygon is continued.

### Examples



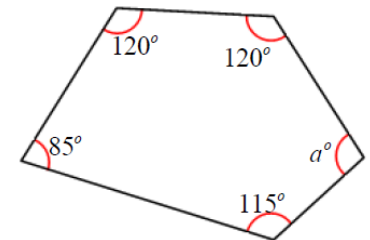
$$29^\circ + 72^\circ = 101^\circ$$

$$180^\circ - 101^\circ = 79^\circ$$



$$169^\circ + 31^\circ + 90^\circ = 290^\circ$$

$$360^\circ - 290^\circ = 70^\circ$$



$$120^\circ + 120^\circ + 85^\circ + 115^\circ = 440^\circ$$

$$540^\circ - 440^\circ = 100^\circ$$

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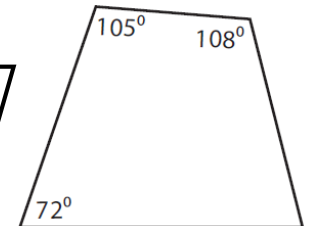
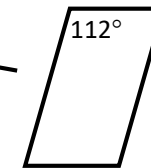
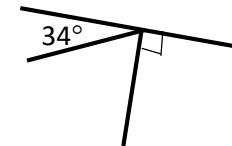
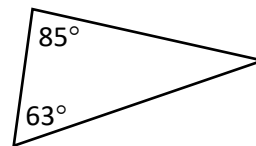
477-487, 560-564,  
812-814

### Tip

Remember isosceles triangles have two equal angles and equilateral triangles have three equal angles.

### Questions

1) Find the missing angles:

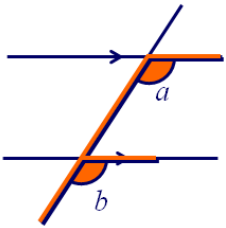


ANSWERS: 1)  $32^\circ$  2)  $56^\circ$  3)  $68^\circ, 112^\circ, 68^\circ$  4)  $75^\circ$

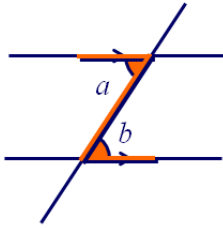
# Year 8 Knowledge Organiser

## PARALLEL LINES AND ANGLES

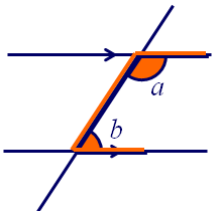
### Key Concepts



**Corresponding** angles are equal.



**Alternate** angles are equal.



**Co-interior** angles add to  $180^\circ$ .

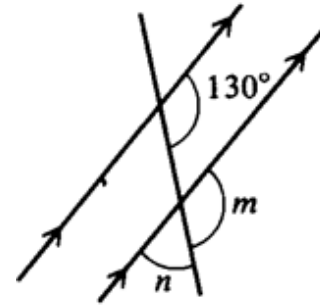
### Key Words

**Intersect:** Two lines which cross.

**Parallel:** Two lines which never intersect. Marked by an arrow on each line.

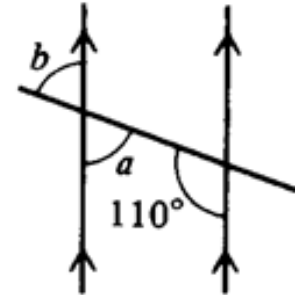
**Transversal:** A line which intersects two parallel lines.

### Examples



$m = 130^\circ$  as corresponding angles are equal.

$n = 50^\circ$  as angles on a line add to  $180^\circ$



$a = 70^\circ$  as co-interior angles add to  $180^\circ$

$b = 70^\circ$  as vertically opposite angles are equal



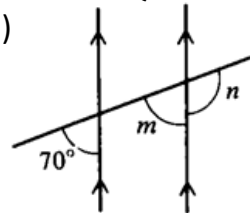
Clip Numbers  
480-491

### Tip

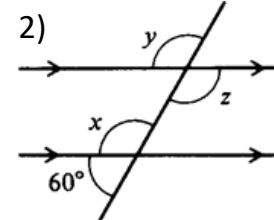
These angle properties can be used alongside all the other angle properties that you have learnt.

### Questions – Find the labelled angles, give reasons.

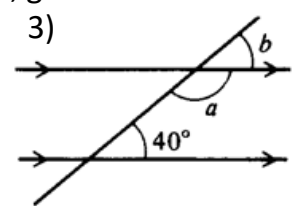
1)



2)



3)



ANSWERS: 1)  $m = 70^\circ, n = 110^\circ$  2)  $x = 120^\circ, y = 120^\circ, z = 120^\circ$  3)  $a = 140^\circ, b = 40^\circ$

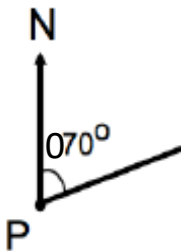
# Year 8 Knowledge Organiser

## SCALES AND BEARINGS

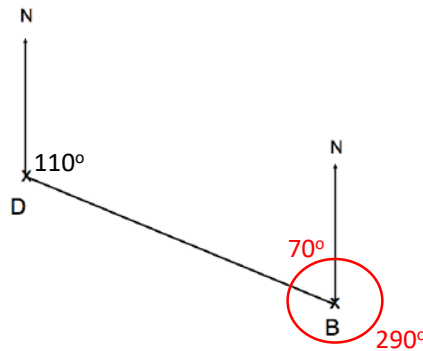
### Key Concepts

**Scales** are used to reduce real world dimensions to a useable size.

A **bearing** is an angle, measured **clockwise** from the **north** direction. It is given as a **3 digit** number.



The diagram shows the position of a boat B and dock D.



The scale of the diagram is 1cm to 5km.

### Examples

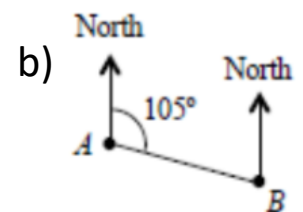
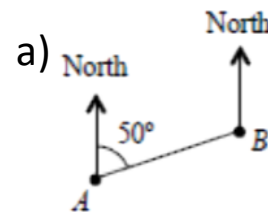
- Calculate the real distance between the boat and the dock.  
 $6\text{cm} = 6 \times 5$   
 $= 30\text{km}$
- State the bearing of the boat from the dock.  
 $110^\circ$
- Calculate the bearing of the dock from the dock.  
 $180^\circ - 110^\circ = 70^\circ$  because the angles are **cointerior**  
 $360^\circ - 70^\circ = 290^\circ$  because angles around a point equal  $360^\circ$

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674-679,492-495

**Key Words**  
 Scale  
 Bearing  
 Clockwise  
 North

**Links**  
 Geography

Find the bearing of A from B  
 (Diagrams not drawn to scale):

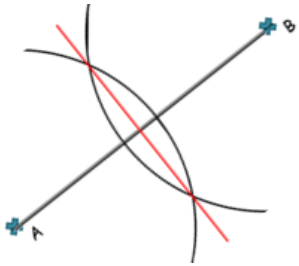


# Year 8 Knowledge Organiser

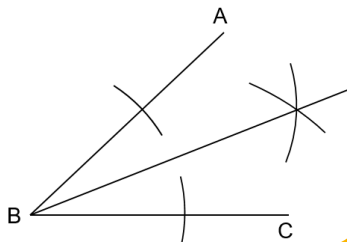
## CONSTRUCTIONS

### Key Concept

Line Bisector



Angle Bisector



### Key Words

**Construction:** To draw a shape, line or angle accurately using a compass and ruler.

**Loci:** Set of points with the same rule.

**Parallel:** Two lines which never intersect.

**Perpendicular:** Two lines that intersect at  $90^\circ$ .

**Bisect:** Divide into two parts.

**Equidistant:** Equal distance.

### Examples

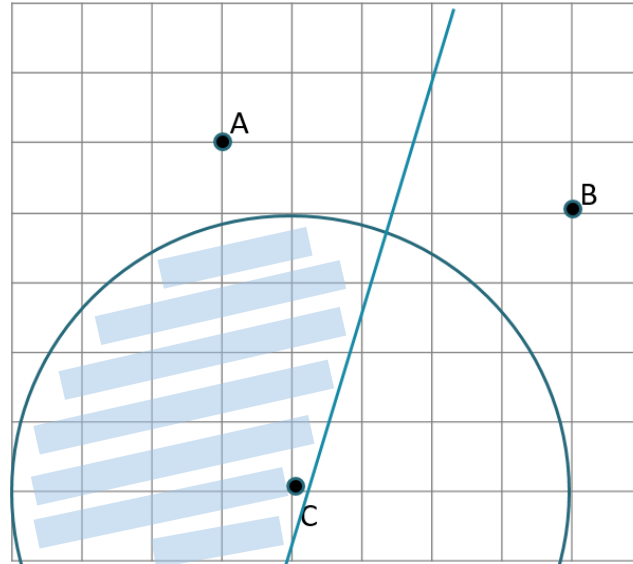
Shade the region that is:

- closer to A than B

- less than 4 cm from C

Line bisector  
of A and B

Circle with  
radius 4cm



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Clip Numbers

660-662,674-677

### Tip

Watch for scales.

For a scale of:  
1 cm = 4 km.

20 km = 5 cm

6 cm = 24 km

### Questions

1) Draw these angles then bisect them using constructions:

a)  $46^\circ$

b)  $18^\circ$

c)  $124^\circ$

2) Draw these lines and bisect them: a) 6cm b) 12cm