

Properties of 2D shapes

Some definitions which may help you...

Equal = the same size/length

Lines of symmetry = A line of symmetry is a line that cuts a shape exactly in half. This means that if you were to fold the shape along the line, both halves would match exactly. Equally, if you were to place a mirror along the line, the shape would remain unchanged.


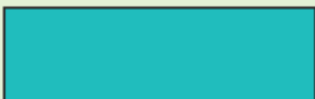





Parallel =



Lines on a plane that never meet. They are always the same distance apart.

Here the red and blue line segments are parallel.

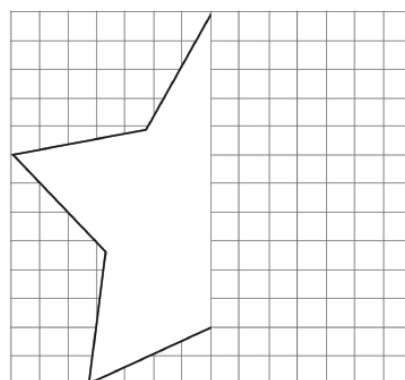
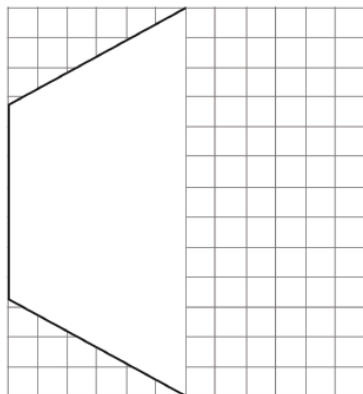
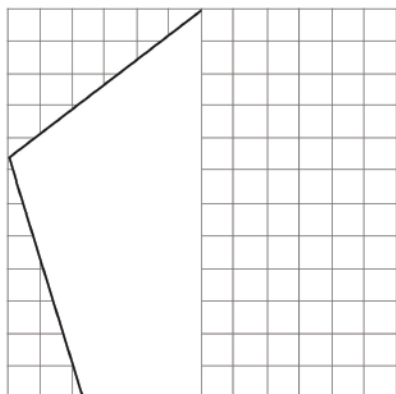
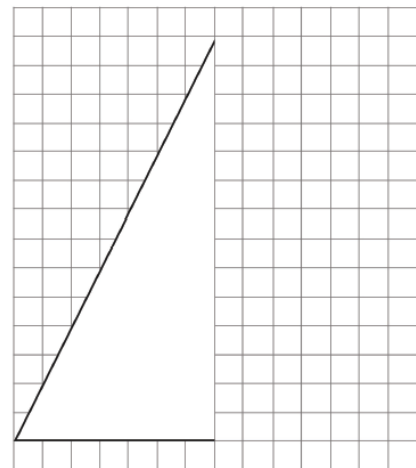
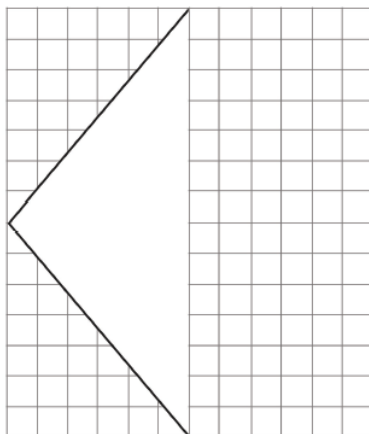
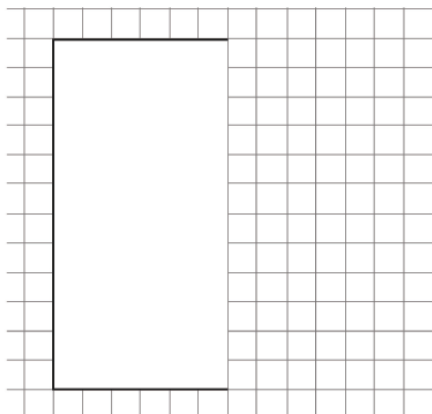
In each row, find the statement which is incorrect. You can use a tick✓ or a cross x in each box to record your answers or shade/colour the incorrect statement.

	Every angle in this shape is a right angle.	This shape has six equal sides.	This shape has six lines of symmetry.
	In this shape, opposite sides are equal.	This shape has four right angles.	This is a regular shape.
	This is an octagon.	All the sides in this shape are equal.	This shape has four lines of symmetry.
	This is a trapezium.	This shape has one pair of parallel sides.	This is a regular shape.
	This shape has no lines of symmetry.	All the sides in this shape are equal.	This shape has one right angle.
	This shape has no lines of symmetry.	This shape has five equal sides.	Each angle in this shape is 108°.
	Opposite sides in this shape are parallel.	Opposite angles in this shape are equal.	This shape has two lines of symmetry.

Can you create 2 correct statements and one incorrect statement (like above) for these 2D Shapes; square. Octagon, circle, kite?

2D Shape Symmetry Drawing

Draw the other half of the shape and make sure it is symmetrical.



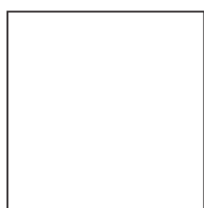
Investigating Lines of Symmetry



Name _____

Sides _____

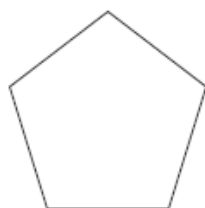
Lines of Symmetry _____



Name _____

Sides _____

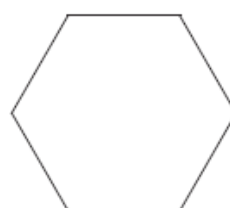
Lines of Symmetry _____



Name _____

Sides _____

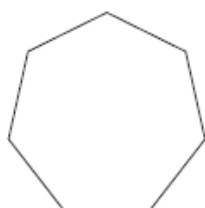
Lines of Symmetry _____



Name _____

Sides _____

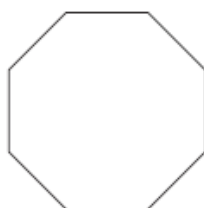
Lines of Symmetry _____



Name _____

Sides _____

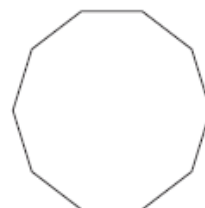
Lines of Symmetry _____



Name _____

Sides _____

Lines of Symmetry _____



Name _____

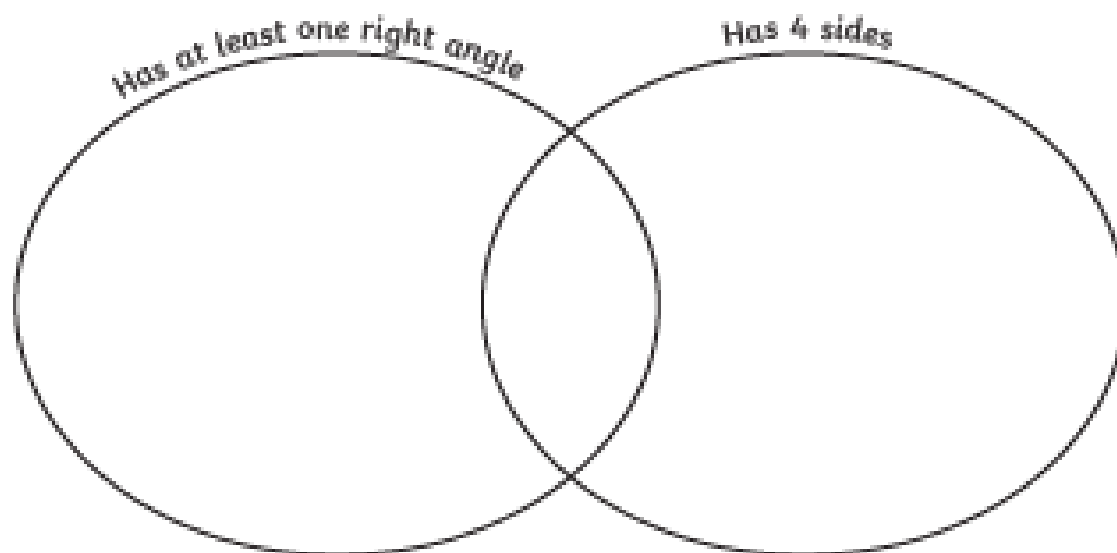
Sides _____

Lines of Symmetry _____

Comparing 2D Shapes, including quadrilaterals and triangles

3. Draw the following shapes in the correct places on the Venn diagram.

- square
- right angled triangle
- pentagon
- parallelogram



4. Match the type of triangle to its definition.

Equilateral

One angle is a right angle

Isosceles

All sides and angles are equal

Scalene

2 sides and angles are equal

Right-angled triangle

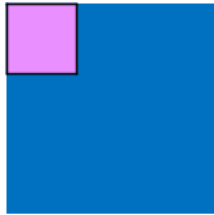
No sides or angles are equal

Can you create a venn diagram to sort the 4 triangles above?

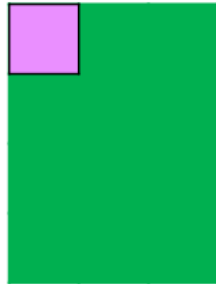
What is area? – Calculating the area of rectilinear shapes by counting squares

1. Which shape is the odd one out?

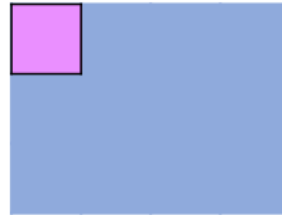
A.



B.



C.



D.



Use the reference square to estimate the area.



H

2. Match the shape to the correct area using the square as a reference.

A.



20 squares

B.



21 squares

C.



18 squares



I

3. Harees is using 6 squares to make different rectilinear shapes. He uses all 6 squares each time.

He says,



When I rearrange the squares to make a different shape, the area of the shape changes.



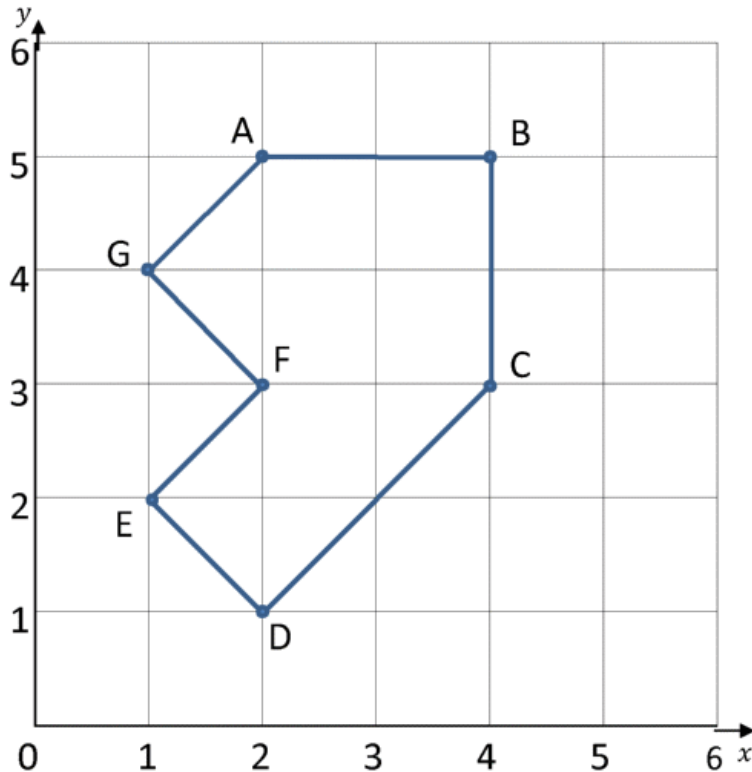
Is Harees correct? Explain your answer.



I
HW/

Describe positions on a 2-D grid as coordinates in the first quadrant

Remember: Along the corridor (x-axis) and up the stairs (y-axis)



1) Write down the coordinates of the points on the first grid.

A (__, __)

B (__, __)

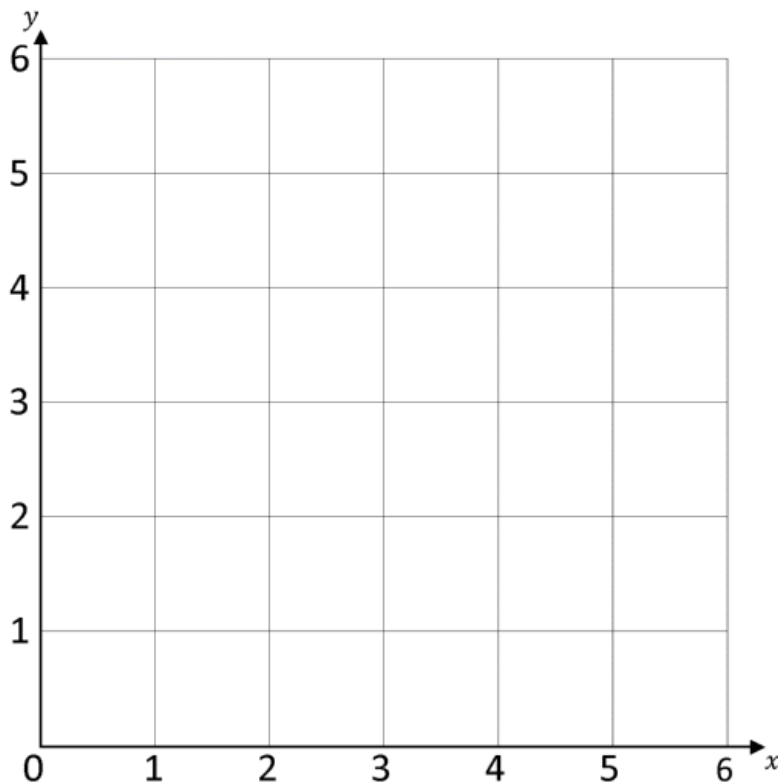
C (__, __)

D (__, __)

E (__, __)

F (__, __)

G (__, __)



2) Plot these coordinates on this grid: (1,2) (2,4) (4,3)

3) Plot the 4th point so that the four coordinates make a square.

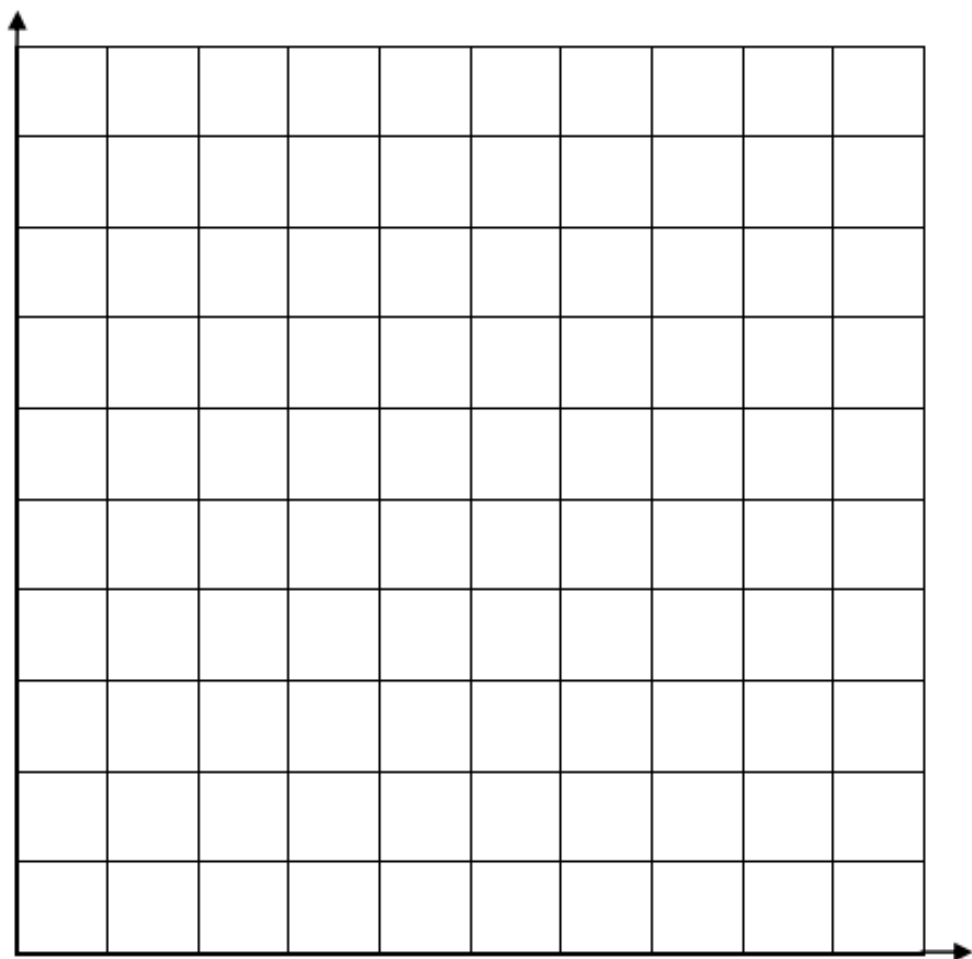
What is the coordinate of the 4th point? (__, __)

4) Plot another square that has no horizontal or vertical lines. What are the 4 coordinates?

(__, __) (__, __)

(__, __) (__, __)

Challenge Sheet – Lesson 5 continued...



1) Number both axes from 0 to 10 and label them.

2) Plot the following coordinates and join them as you go.

(0,5) (2,7) (2,8) (3,7) (3,8) (4,7) (4,5) (8,5) (9,4) (10,2)
(9,3) (9,2) (8,0) (7,0) (8,2) (7,3) (6,0) (5,0) (6,2) (4,2)
(3,0) (2,0) (3,2) (2,2) (1,0) (0,0) (2,3) (2,5) (0,5)

3) Plot and join the following coordinates.

(10,10) (8,9) (8,8) (10,7)

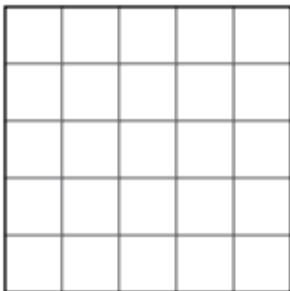
Measure and Calculate the Perimeter of a Rectilinear Figure

Aim: I can measure and calculate the perimeter of a square and a rectangle.

The Perimeter of Squares

Count the length of one side of each square and multiply by 4 to find the perimeter.

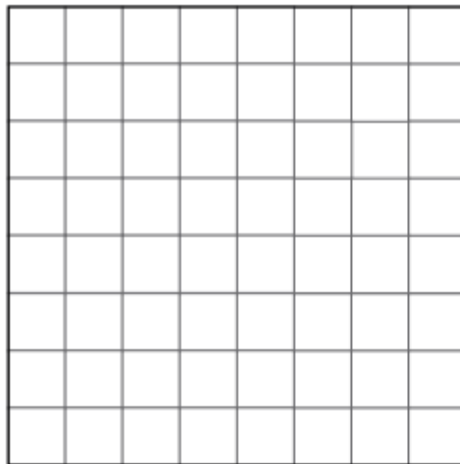
1.



1 side = _____

perimeter = _____

2.



1 side = _____

perimeter = _____

The Perimeter of Rectangles

Count the length of two sides of each rectangle, add together and multiply by 2 to find the perimeter.

1.

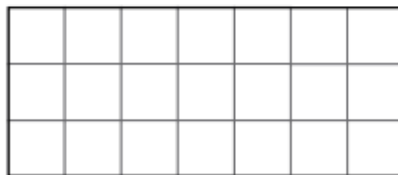


side 1 = _____

side 2 = _____

perimeter = _____

2.

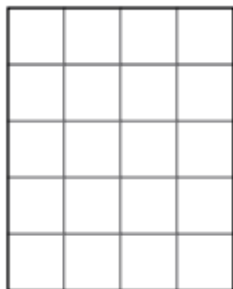


side 1 = _____

side 2 = _____

perimeter = _____

3.

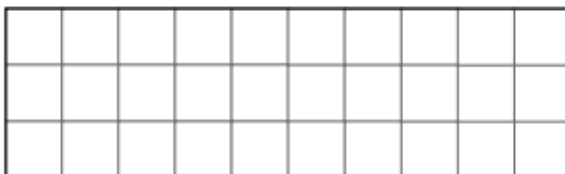


side 1 = _____

side 2 = _____

perimeter = _____

4.



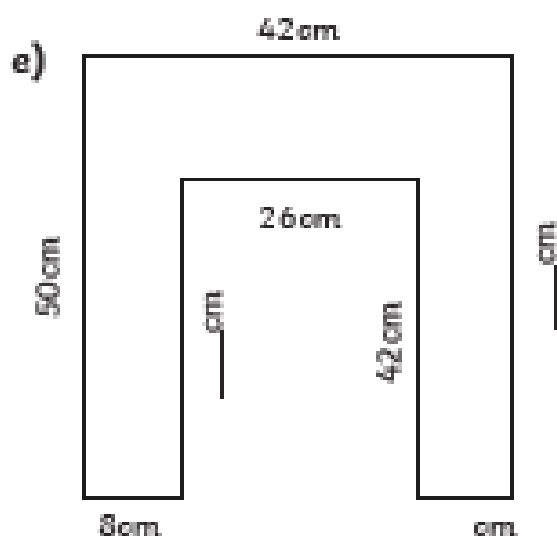
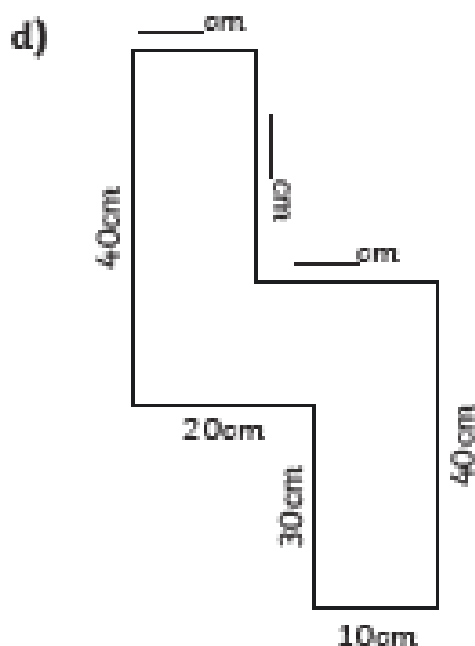
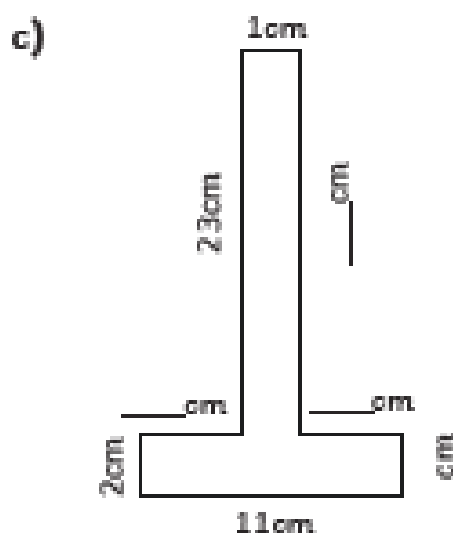
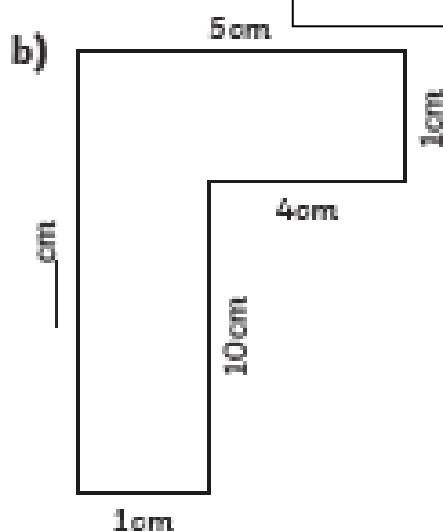
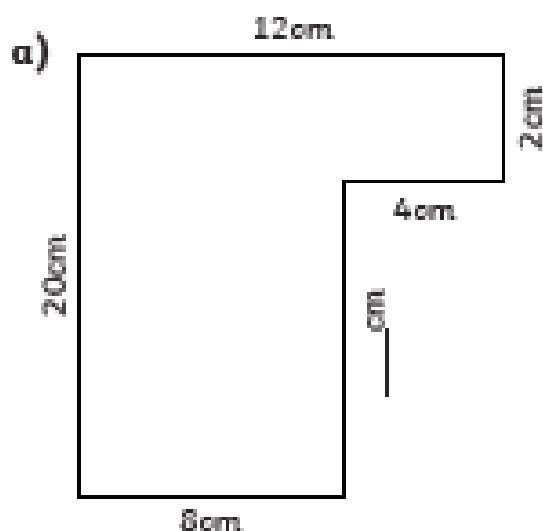
side 1 = _____

side 2 = _____

perimeter = _____

- 1) Find the missing side lengths and calculate the perimeter of these rectilinear shapes.

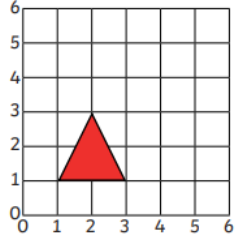
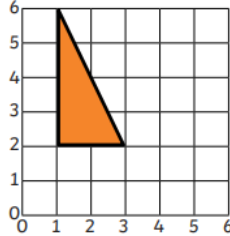
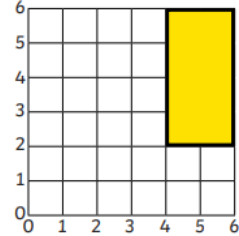
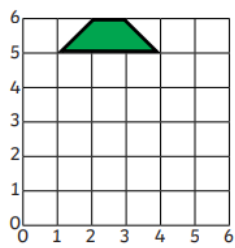
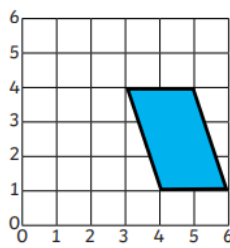
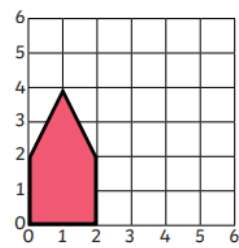
**Challenge Sheet –
Lesson 6 continued**

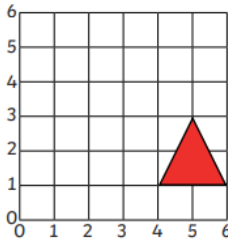
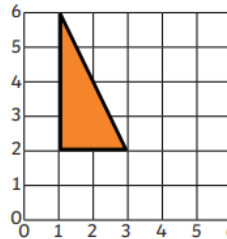
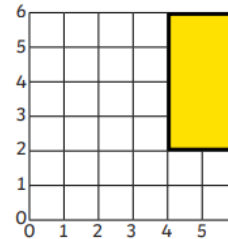
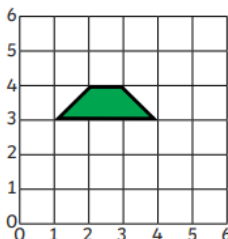
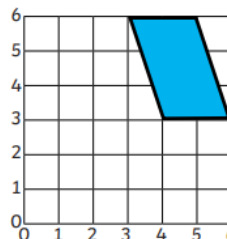
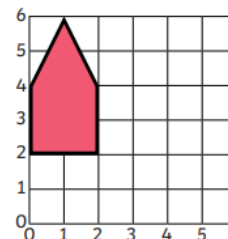


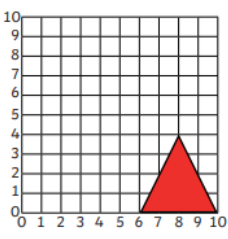
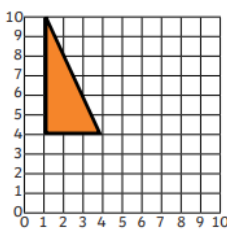
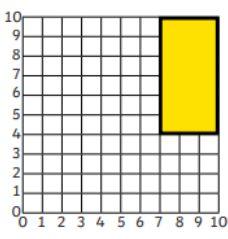
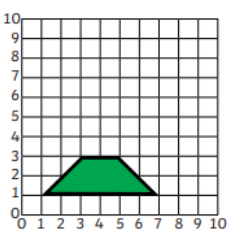
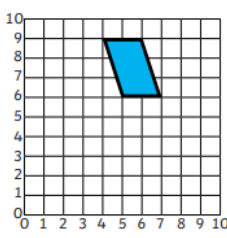
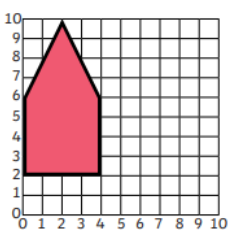
- 2) Draw three different rectilinear shapes that have a perimeter of 20cm.

Draw Translated Shapes

Draw the 2D shapes in their new positions after a translation along one or both axis

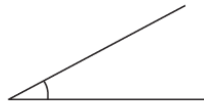
 <p>This equilateral triangle is translated <u>up 3</u>. Draw the triangle in its new position.</p>	 <p>This right-angled triangle is translated <u>right 3</u>. Draw the triangle in its new position.</p>	 <p>This rectangle is translated <u>left 4</u>. Draw the rectangle in its new position.</p>
 <p>This trapezium is translated <u>down 2</u>. Draw the trapezium in its new position.</p>	 <p>This parallelogram is translated <u>left 3</u>. Draw the parallelogram in its new position.</p>	 <p>This pentagon is translated <u>right 3</u>. Draw the pentagon in its new position.</p>

 <p>This equilateral triangle is translated <u>left 3, up 3</u>. Draw the triangle in its new position.</p>	 <p>This right-angled triangle is translated <u>right 3, down 2</u>. Draw the triangle in its new position.</p>	 <p>This rectangle is translated <u>left 4, down 1</u>. Draw the rectangle in its new position.</p>
 <p>This trapezium is translated <u>right 2, up 2</u>. Draw the trapezium in its new position.</p>	 <p>This parallelogram is translated <u>left 3, down 2</u>. Draw the parallelogram in its new position.</p>	 <p>This pentagon is translated <u>right 4, down 2</u>. Draw the pentagon in its new position.</p>

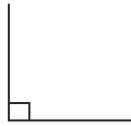
 <p>This equilateral triangle is translated <u>left 5, up 5</u>. Draw the triangle in its new position.</p>	 <p>This right-angled triangle is translated <u>right 6, down 3</u>. Draw the triangle in its new position.</p>	 <p>This rectangle is translated <u>left 5, down 2</u>. Draw the rectangle in its new position.</p>
 <p>This trapezium is translated <u>right 2, up 7</u>. Draw the trapezium in its new position.</p>	 <p>This parallelogram is translated <u>left 3, down 5</u>. Draw the parallelogram in its new position.</p>	 <p>This pentagon is translated <u>right 6, down 2</u>. Draw the pentagon in its new position.</p>

Angles

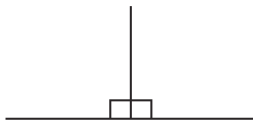
An angle measures a turn



A right angle is the corner of a square



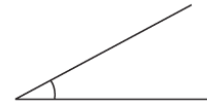
2 right angles make a straight line



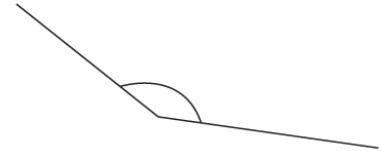
Angles

Read the information at the top of this page about angles, and then use this to help you with the questions below.

An acute angle is less than a right angle (90°)



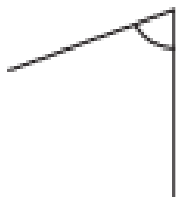
An obtuse angle is between a right angle and a straight line.



Angles

1. Order these angles from smallest to largest.

A



B



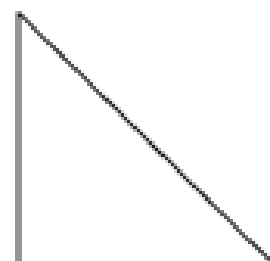
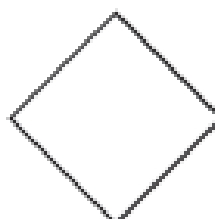
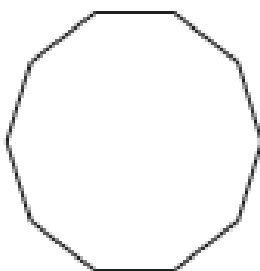
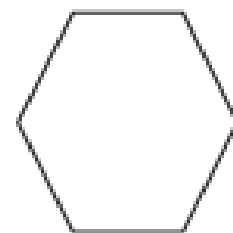
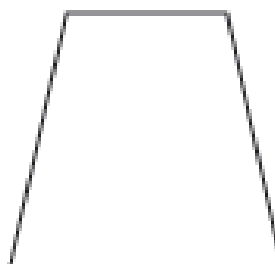
C



D

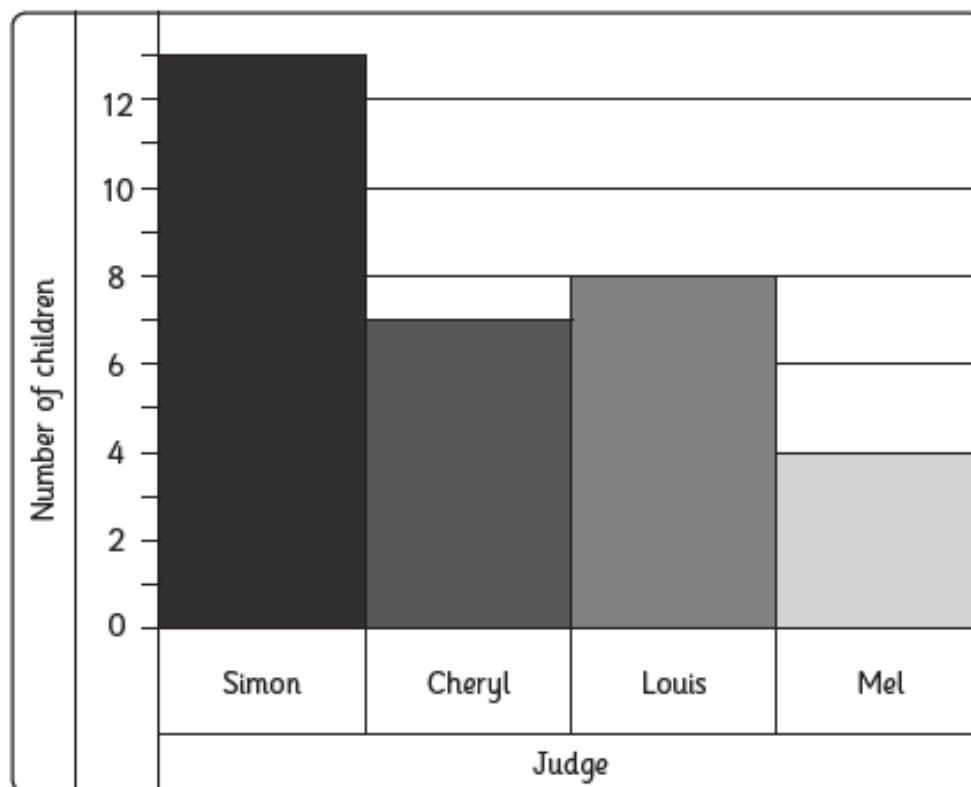


2. Tick all the shapes that have obtuse angles.



Bar Charts

1. Here is a bar chart showing Year 4's favourite X Factor Judges:



a) How many children like Cheryl the best?

b) How many more children prefer Simon than Louis?

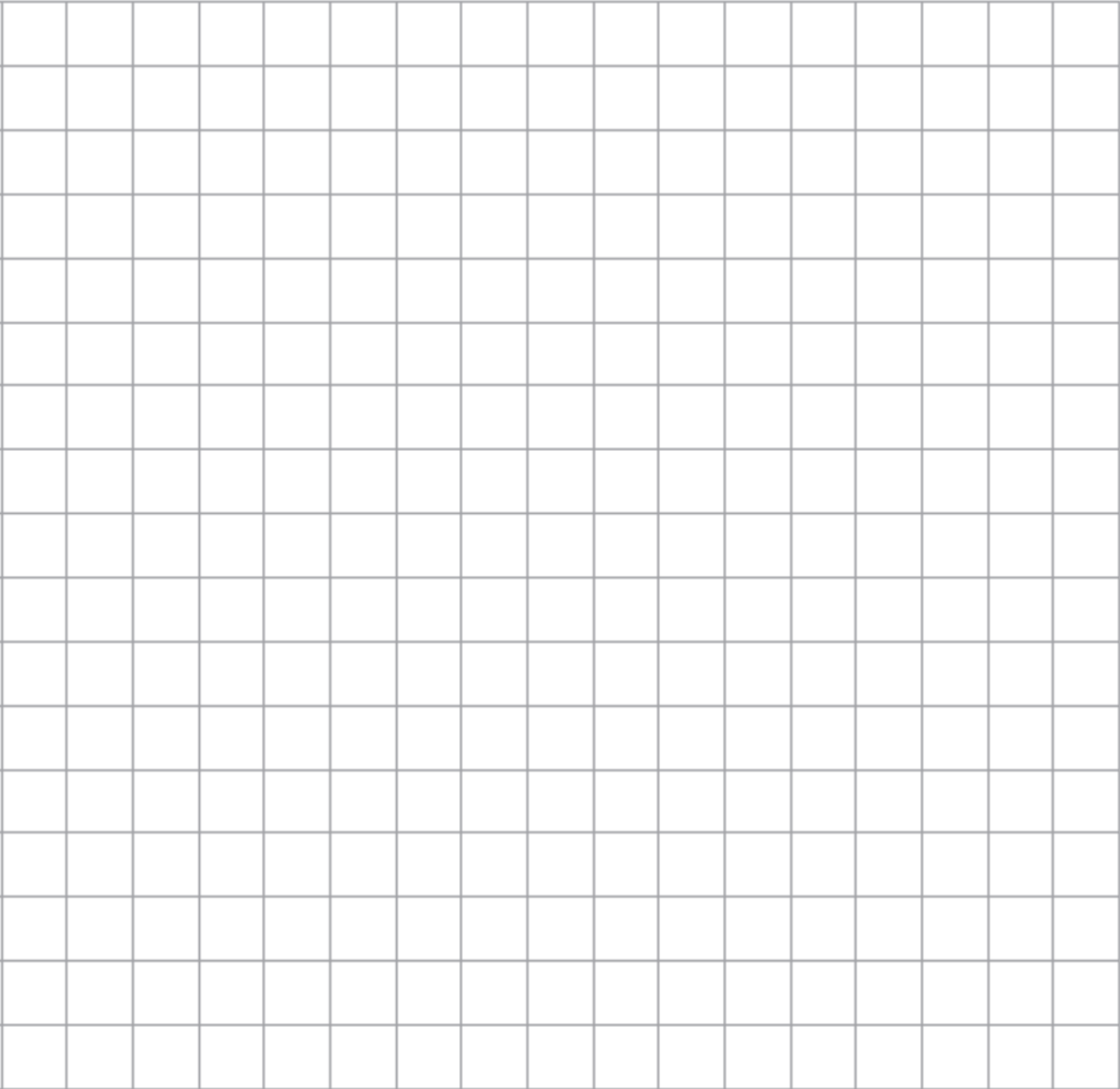
c) Chris was absent when the survey was taken, he said he liked Louis the best, so including Chris' vote, how many children liked Louis the best?

2. Year 4 did a survey outside school and collected the following data regarding the colours of cars that passed their school:

colour of car	number that passed by
red	20
blue	16
silver	9
white	5
gold	1
yellow	2

Continue over page...

a) Use the data to draw a bar chart on the grid below. Make sure you label the axes, give the chart a title and choose a suitable scale for the axes.



Answer these questions about the graph:

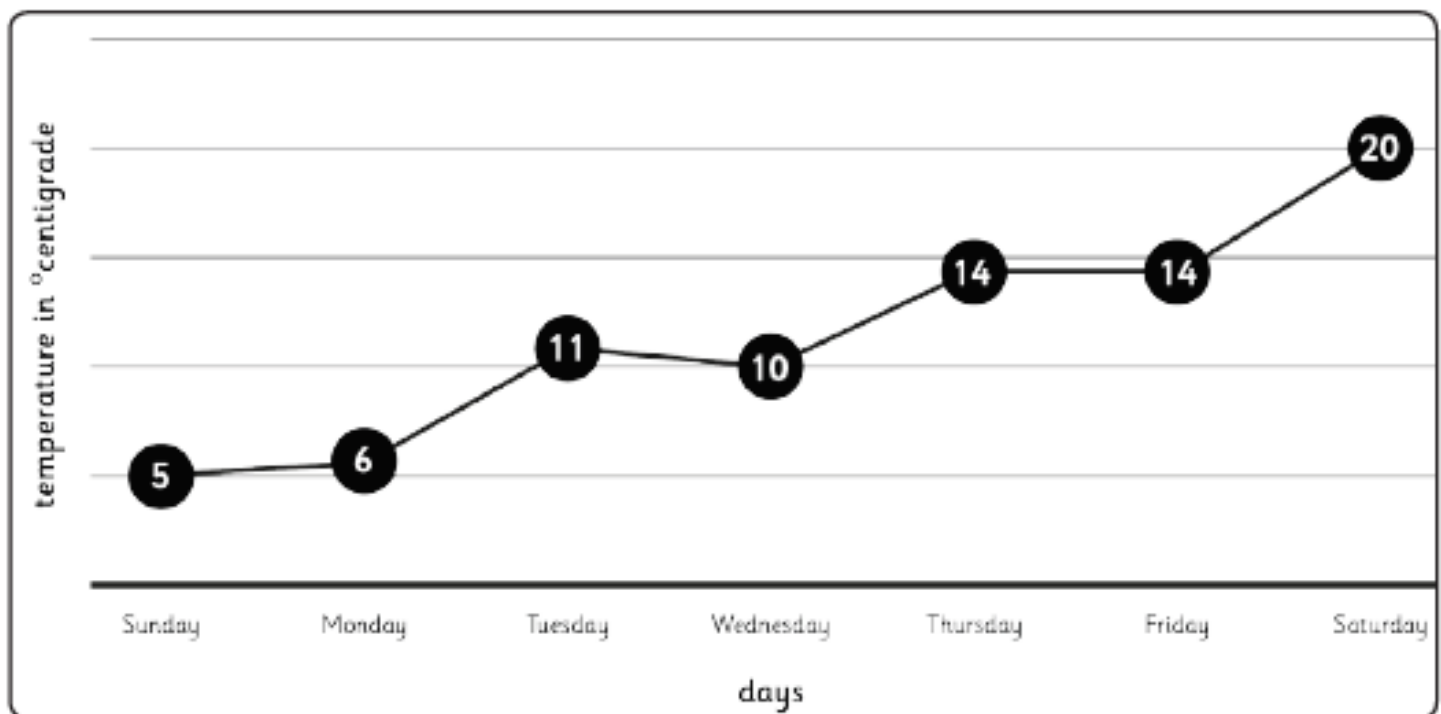
b) How many more blue cars were there than yellow?

c) Which is the biggest total: Red and yellow or blue and silver?

d) How many cars passed by the school altogether?

Line graphs & pictograms

3. Here is a line graph to show the maximum temperatures in a town across a week:



a) Was the temperature gradually getting warmer or colder across the week?

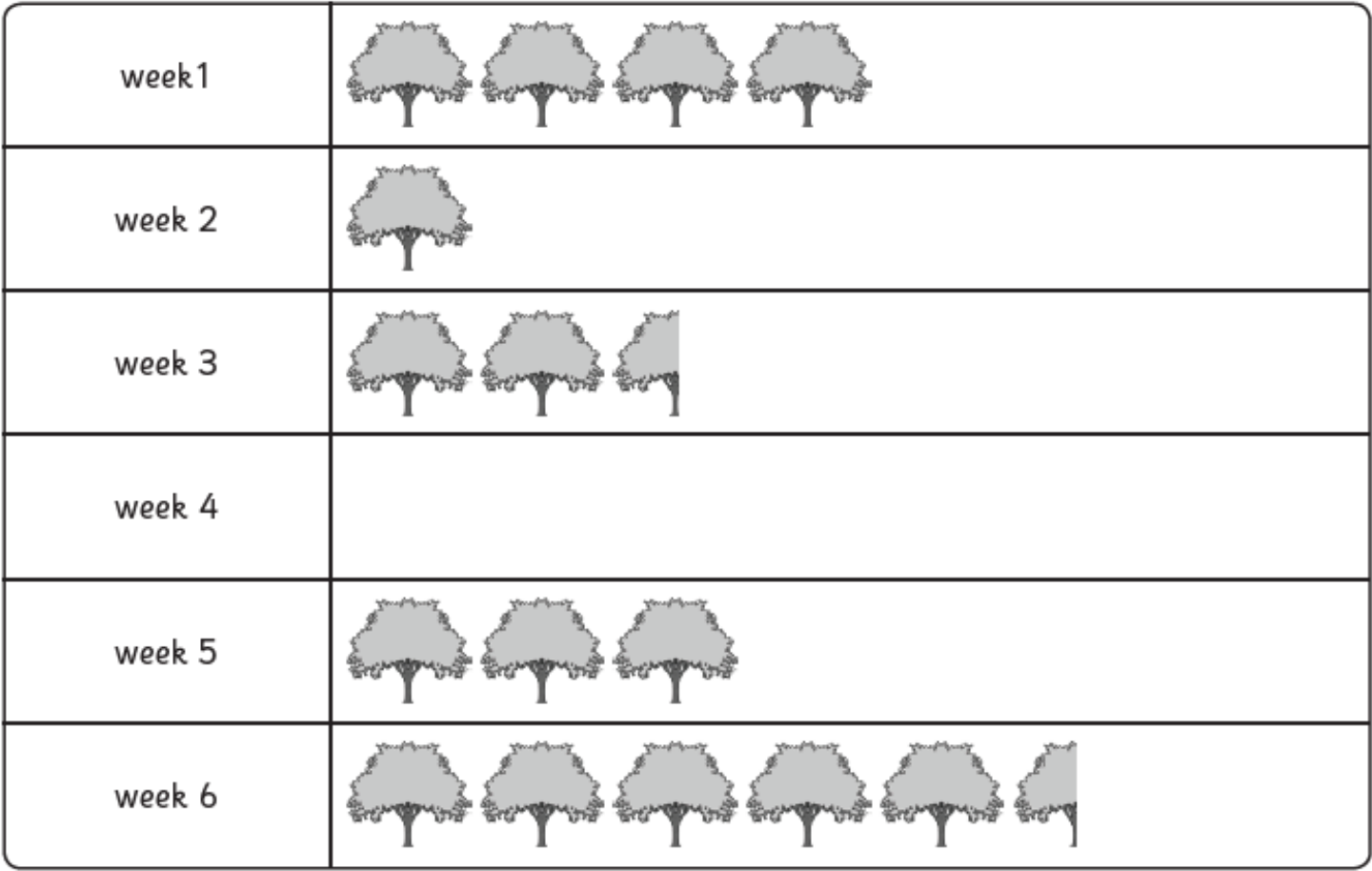
b) Between which 2 days was there a fall in the temperature?


c) What was the difference in temperature between the coldest and the warmest days?


d) What was the difference in temperature between Tuesday and Thursday?

Continue over page...

4. The following pictogram shows a tree planting project in a local town:










 = 2 trees

- a) What does  represent?
- b) There were 4 trees planted in week 4, add this to the chart.
- c) Which week were the most trees planted?
- d) How many trees were planted in week 6?

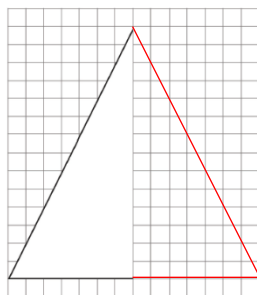
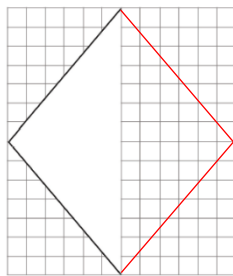
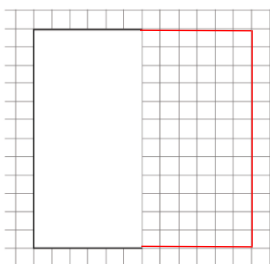
Answers

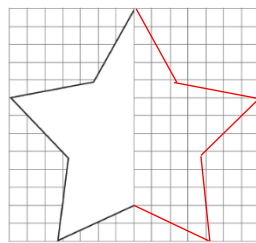
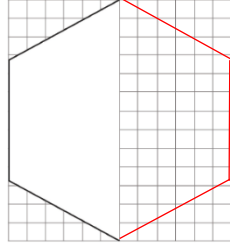
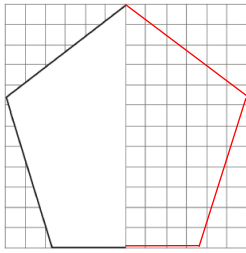
When you have completed your work each day – check/mark your answers to see how you have performed.

Properties of 2D shape – Lesson 1

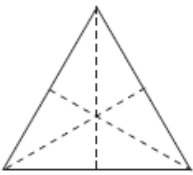
	Every angle in this shape is a right angle.	This shape has six equal sides.	This shape has six lines of symmetry.
	In this shape, opposite sides are equal.	This shape has four right angles.	This is a regular shape.
	This is an octagon.	All the sides in this shape are equal.	This shape has four lines of symmetry.
	This is a trapezium.	This shape has one pair of parallel sides.	This is a regular shape.
	This shape has no lines of symmetry.	All the sides in this shape are equal.	This shape has one right angle.
	This shape has no lines of symmetry.	This shape has five equal sides.	Each angle in this shape is 108° .
	Opposite sides in this shape are parallel.	Opposite angles in this shape are equal.	This shape has two lines of symmetry.

2D Shape symmetry drawing – Lesson 2





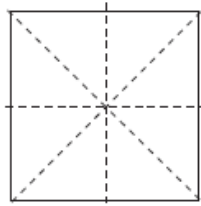
Investigating Lines of Symmetry **Answers**



Name triangle (equilateral)

Sides 3

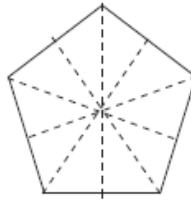
Lines of Symmetry 3



Name square

Sides 4

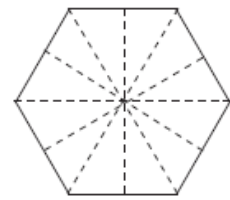
Lines of Symmetry 4



Name pentagon

Sides 5

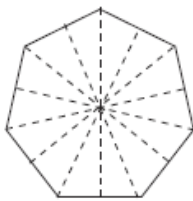
Lines of Symmetry 5



Name hexagon

Sides 6

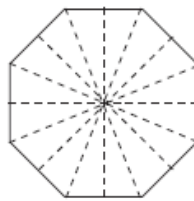
Lines of Symmetry 6



Name heptagon

Sides 7

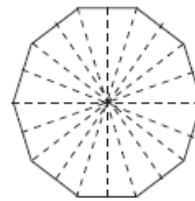
Lines of Symmetry 7



Name octagon

Sides 8

Lines of Symmetry 8

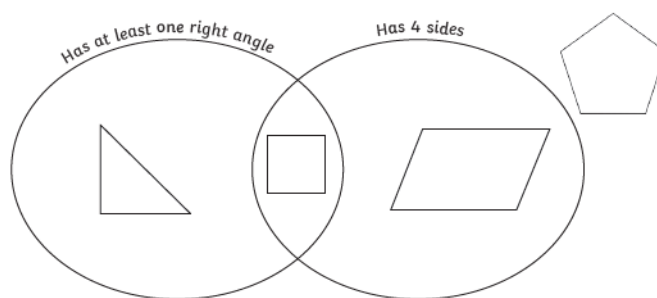


Name decagon

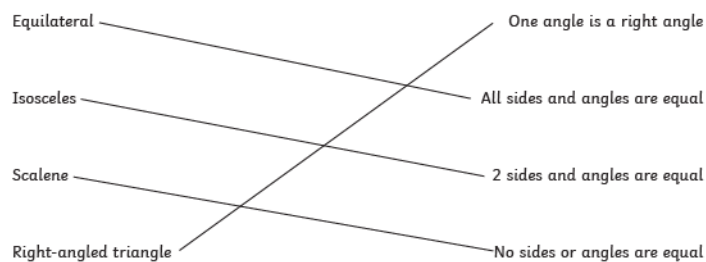
Sides 10

Lines of Symmetry 10

Comparing 2D Shapes, including quadrilaterals and triangles – Lesson 3



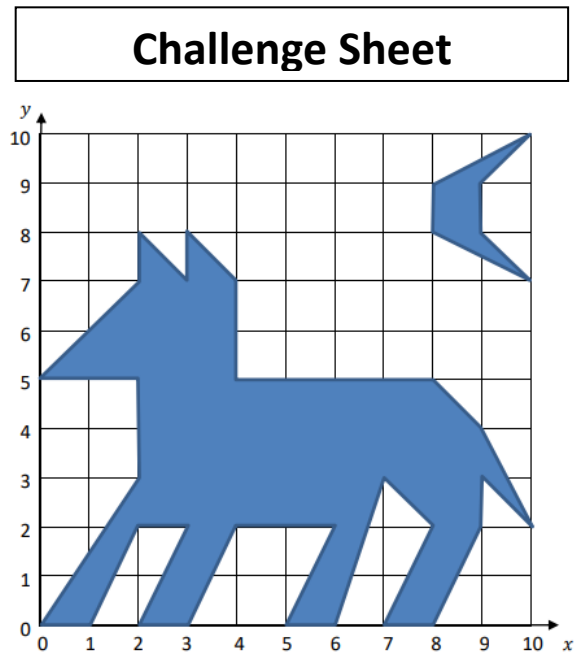
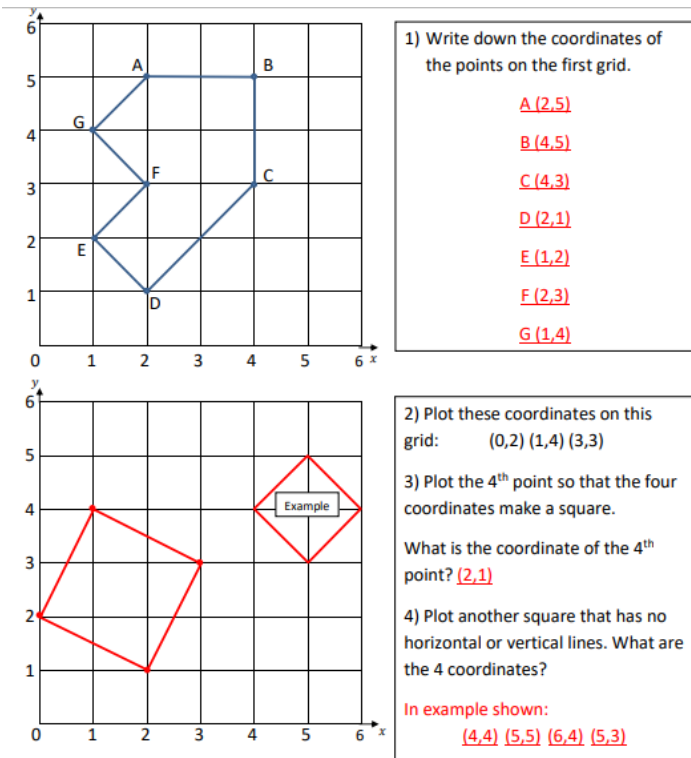
4. Match the type of triangle to its definition.



What is area? – Lesson 4

1. A is the odd one out because it has an area of 9 squares. B, C and D have an area of 12 squares.
2. A. 20 squares; B. 18 squares; C. 21 squares
3. No, Harees is not correct because as long as he uses all six squares, every shape he makes will have an area of 6 squares.

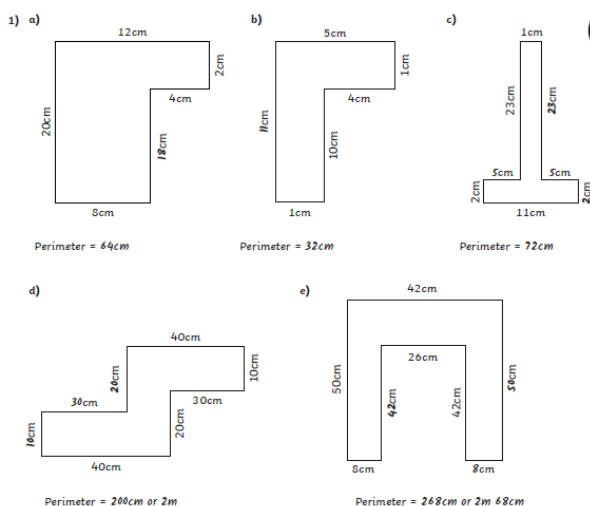
Describe positions on a 2-D grid as coordinates in the first quadrant – Lesson 5



Measure & Calculate the perimeter of a rectilinear shape – Lesson 6

The Perimeter of Squares

1. 1 side = 5cm
perimeter = 20cm
2. 1 side = 8cm
perimeter = 32cm
1. side 1 = 6cm
side 2 = 1cm
perimeter = 14cm
2. side 1 = 7cm
side 2 = 3cm
perimeter = 20cm
3. side 1 = 4cm
side 2 = 5cm
perimeter = 18cm
4. side 1 = 10cm
side 2 = 3cm
perimeter = 26cm



Challenge Sheet

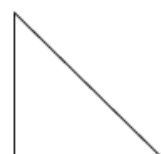
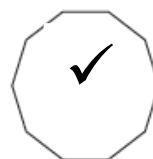
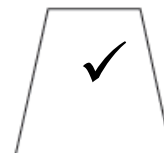
Draw Translated Shapes – Lesson 7

<p>This equilateral triangle is translated up 3. Draw the triangle in its new position.</p>	<p>This right-angled triangle is translated right 3. Draw the triangle in its new position.</p>	<p>This rectangle is translated left 4. Draw the rectangle in its new position.</p>
<p>This trapezium is translated down 2. Draw the trapezium in its new position.</p>	<p>This parallelogram is translated left 3. Draw the parallelogram in its new position.</p>	<p>This pentagon is translated right 3. Draw the pentagon in its new position.</p>
<p>This equilateral triangle is translated left 3, up 3. Draw the triangle in its new position.</p>	<p>This right-angled triangle is translated right 3, down 2. Draw the triangle in its new position.</p>	<p>This rectangle is translated left 4, down 1. Draw the rectangle in its new position.</p>
<p>This trapezium is translated right 2, up 2. Draw the trapezium in its new position.</p>	<p>This parallelogram is translated left 3, down 2. Draw the parallelogram in its new position.</p>	<p>This pentagon is translated right 4, down 2. Draw the pentagon in its new position.</p>
<p>This equilateral triangle is translated left 5, up 5. Draw the triangle in its new position.</p>	<p>This right-angled triangle is translated right 6, down 3. Draw the triangle in its new position.</p>	<p>This rectangle is translated left 5, down 2. Draw the rectangle in its new position.</p>
<p>This trapezium is translated right 2, up 7. Draw the trapezium in its new position.</p>	<p>This parallelogram is translated left 3, down 5. Draw the parallelogram in its new position.</p>	<p>This pentagon is translated right 6, down 2. Draw the pentagon in its new position.</p>

Angles – Lesson 8

1. D, A, C, B

2.



Bar Chart – Lesson 9

1a	7
1b	5
1c	9
2a	Award 1 mark for each of the following: Suitable title Suitable label for horizontal axis Suitable label for vertical axis Suitable scale, equally spaced Bars drawn accurately for each colour of car Bars equally spaced and equally drawn on the chart
2b	14
2c	blue and silver
2d	53

Bar Chart – Lesson 10

3a	warmer
3b	Tuesday and Wednesday
3c	15°
3d	3°
4a	1 tree
4b	2 whole trees drawn in week 4
4c	week 6
4d	11