GCSE Maths – Geometry

Vocabulary and Notation

Worksheet

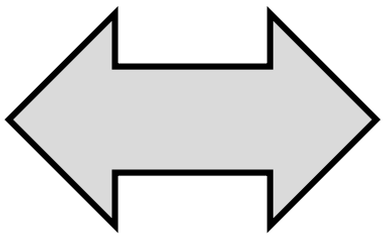
WORKED SOLUTIONS

This worksheet will show you how to work out different types of vocabulary and notation questions. Each section contains a worked example, a question with hints and then questions for you to work through on your own.

Section A

Worked Example

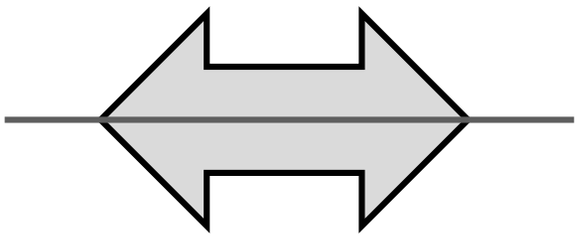
A shape is drawn below. Draw two lines of symmetry on this shape.



Step 1: A line of symmetry cuts a shape exactly in half, so that each side is mirrored. Draw the first line of symmetry.

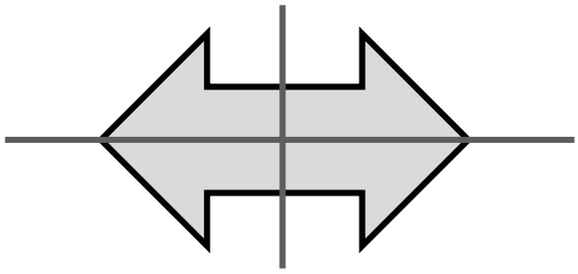
The question is asking you to draw two lines of symmetry, which will split the shape into four sections. Each section should mirror the other sections.

The first line should cut the shape in half vertically.



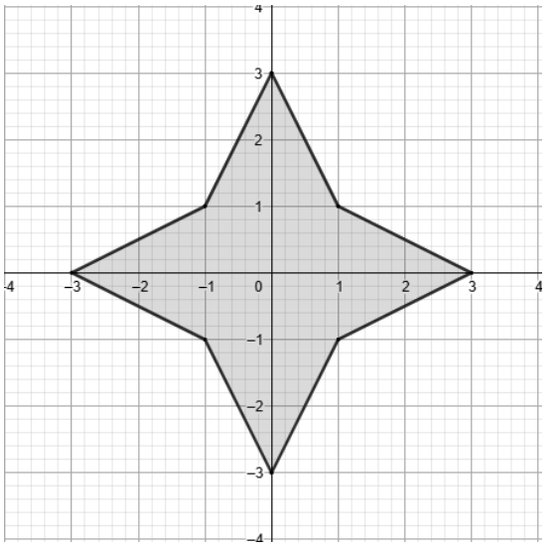
Step 2: Add a second line so that all four sections are the same.

The second line should cut the shape horizontally.



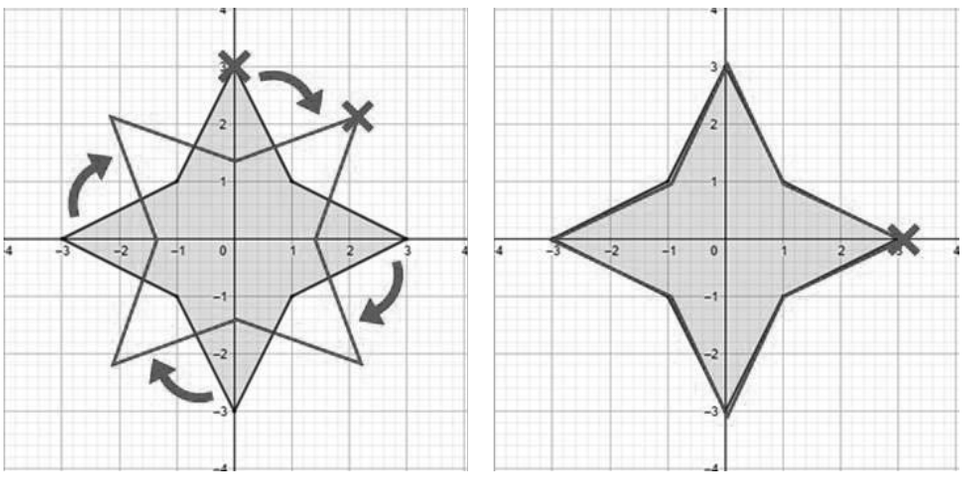
Worked Example

A shape is shown on the grid below. What is the order of symmetry of this shape?



Step 1: A shape with rotational symmetry will still look the same after it has been rotated (turned around a point) by less than one full turn. The number of times it matches up with the original shape during the rotation is called the order of symmetry.

To work out the rotational symmetry, imagine turning the shape around the centre point. Keep track of one of the points so you can see when a full turn is complete.



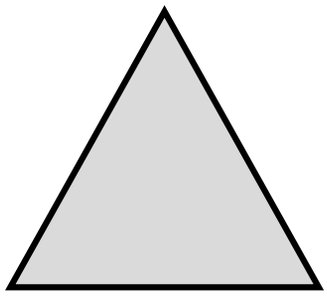
Step 2: Count the number of times the shape matches up with the original.

The shape will match up 4 times. This means it has rotational symmetry order 4.

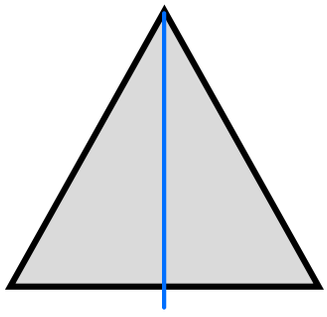
Answer = 4

Guided Example

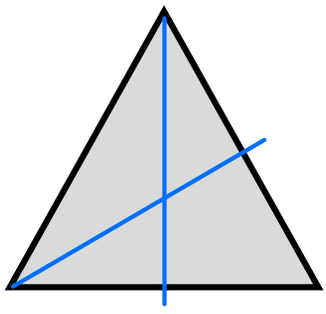
Draw three lines of symmetry on the shape below.



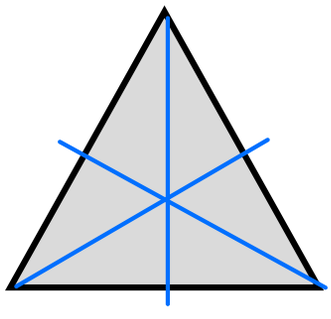
Step 1: Draw one line of symmetry that cuts the shape in half.



Step 2: Draw another line of symmetry that cuts two sections in half.



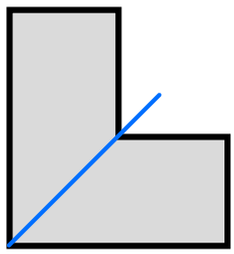
Step 3: Draw the third line of symmetry to cut the remaining two sections in half. All the sections should be the same.



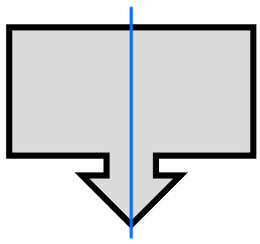
Now it's your turn!
If you get stuck, look back at the worked and guided examples.

1. Draw the stated number of lines of symmetry on the shapes below:

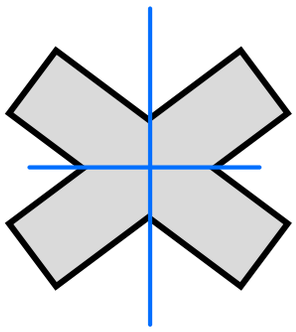
a) One line.



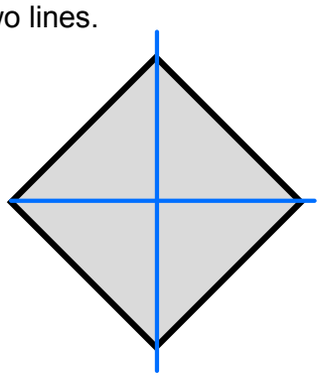
b) One line.



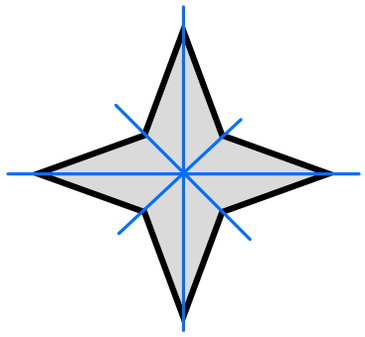
c) Two lines.



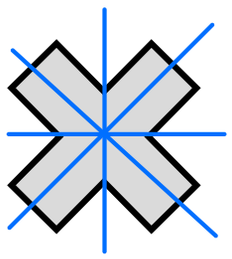
d) Two lines.



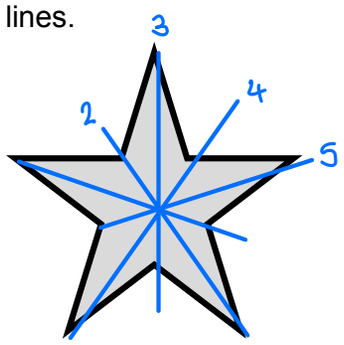
e) Four lines.



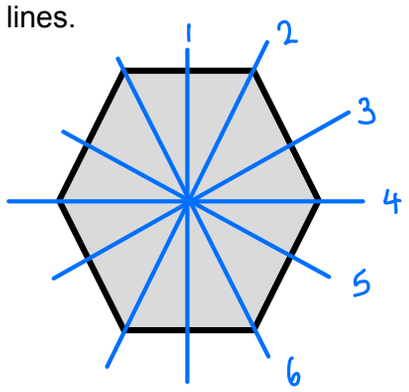
f) Four lines.



g) Five lines.



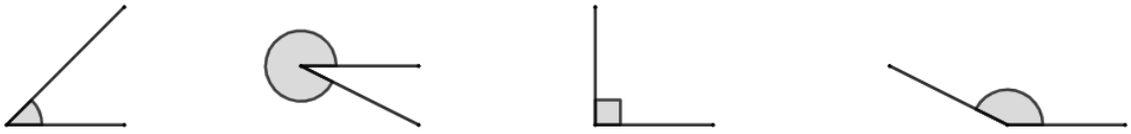
h) Six lines.



Section B

Worked Example

Define the angles below as acute, obtuse, right-angled or reflex.



Step 1: The first angle is acute.

It is acute because the angle is less than a right-angle.

Step 2: The second angle is reflex.

It is reflex because it is more than a straight line, but less than a full turn.

Step 3: The third angle is a right-angle.

We can tell that it is a right-angle because the angle is marked with a square symbol.

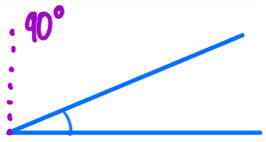
Step 4: The fourth angle is an obtuse angle.

It is obtuse because it is more than a right-angle but less than a straight line.

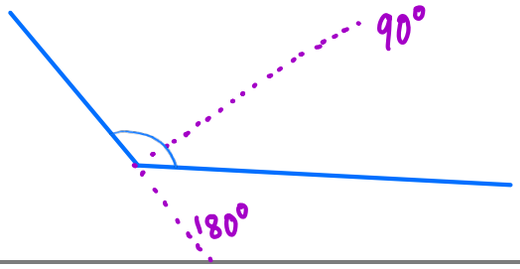
Guided Example

Draw an acute angle and an obtuse angle.

Step 1: An acute angle is less than a right-angle. Draw two lines connected at a point and mark the angle.



Step 2: An obtuse angle is less than a half-turn but more than a right angle. Draw two lines connected at a point and mark the angle.

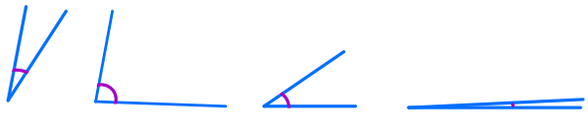


Now it's your turn!
If you get stuck, look back at the worked and guided examples.

2. Draw the angles below:

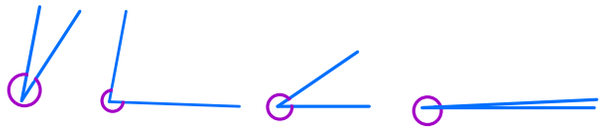
a) An acute angle.

Less than 90°



b) A reflex angle.

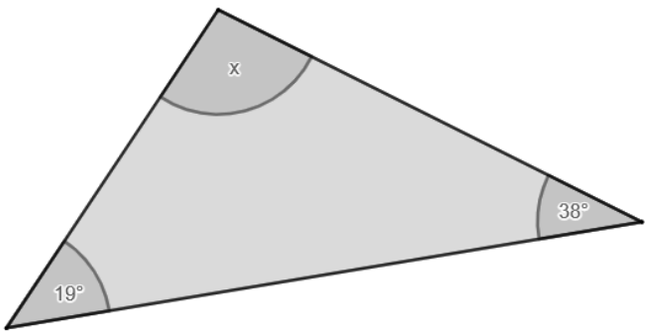
Between 180° and 360°



c) A half-turn. 180° - straight line

d) A full turn. 360°

3. The diagram below shows a triangle with three angles marked. Daniel says



"The size of angle x is 76°."

Is Daniel correct? Give a reason for your answer.

Angels in triangle add up to 180°.

$19 + 38 + x = 180$

$x + 57 = 180$

-57

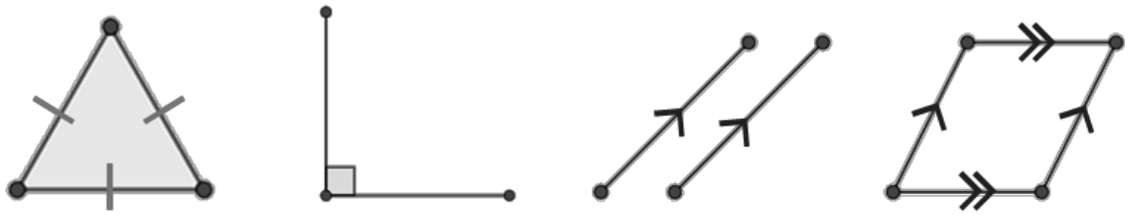
$x = 123°$

Daniel is wrong, $x = 123°$.

Section C

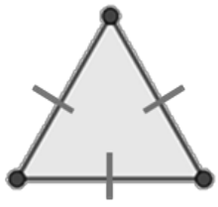
Worked Example

Describe the following lines using the words *parallel*, *perpendicular,* and *equal*.



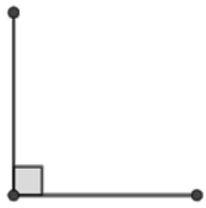
Step 1: The first image shows a triangle with equal lines.

We know the lines are of equal length because they are marked with straight markings (/).



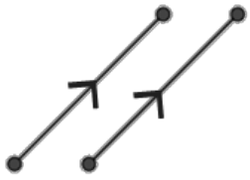
Step 2: The second pair of lines are perpendicular.

We can tell that the lines are perpendicular (at a right-angle) because they are marked with a square symbol.



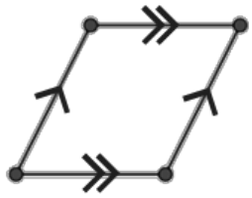
Step 3: The third pair of lines are parallel.

The two arrows point in the same direction along the lines. This indicates that they are parallel.



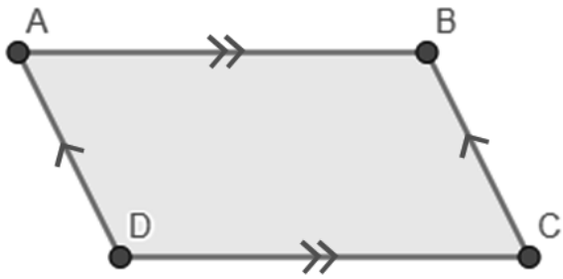
Step 4: The fourth shape is a parallelogram (two pairs of parallel lines).

We know that the lines pointing upwards are parallel because they are marked with single arrowheads. We also know that the horizontal lines are parallel because they are marked with double arrowheads. This means that the shape is a parallelogram.

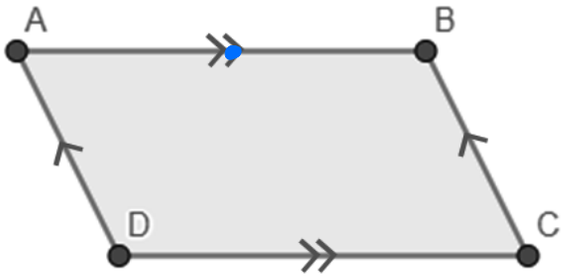


Guided Example

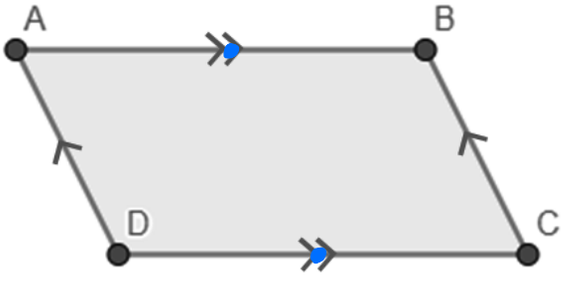
In parallelogram ABCD, draw a line through the midpoint of AB and CD that is also parallel to CB.



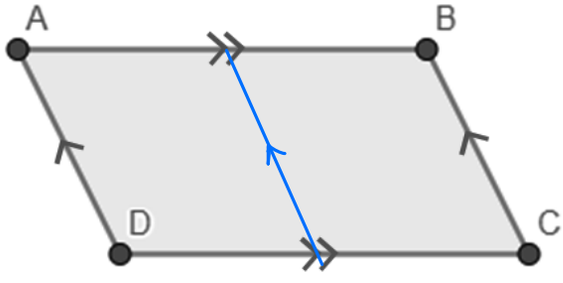
Step 1: Find the midpoint of AB by measuring the line with a ruler. * Not to scale



Step 2: Find the midpoint of DC by measuring the line with a ruler.

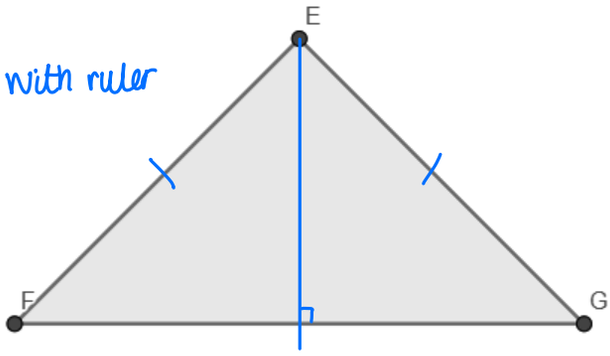


Step 3: Connect the two midpoints and mark the line as parallel to CB.



Now it's your turn!
If you get stuck, look back at the worked and guided examples.

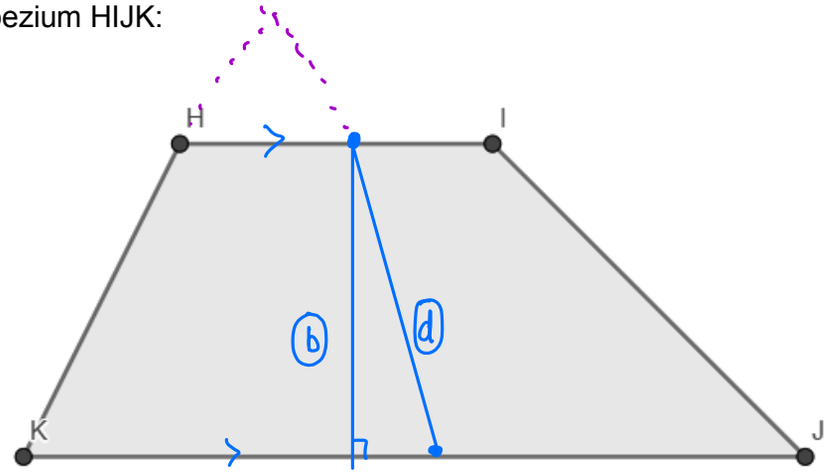
4. In the triangle EFG:



a) Mark the lines of equal length. Measure with ruler
b) Draw a line through point E that is perpendicular to the line FG.
c) Is this line a line of symmetry? Explain your answer.

Yes, because it split the shape in half.

5. In the trapezium HIJK:



a) Mark the parallel lines. - never meet
b) Draw a line through the midpoint of HI that is perpendicular to KJ.
c) Is this a line of symmetry? Explain your answer.

No, because it does not split the shape in half and the shapes don't look the same on either side of the line.

d) Draw a line through the midpoints of HI and KJ. Is this line parallel to HK?

No, because the lines will meet eventually as demonstrated.

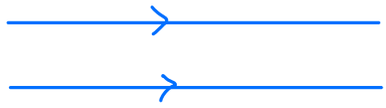
e) Are any of the lines in the trapezium equal?

① Measure lengths

No, none of the lengths are equal.

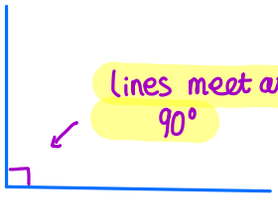
6. Draw and annotate:

a) A pair of parallel lines.



Lines will never meet

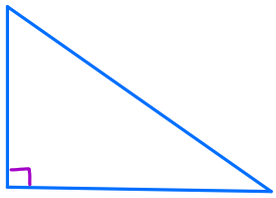
b) A pair of perpendicular lines.



lines meet at 90°

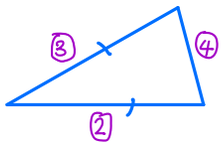
c) A triangle with a right angle.

① Draw 2 perpendicular lines
② Join the ends of these lines



d) A triangle with two equal sides.

① Choose a length - x
② Draw the line - x cm
③ At one of the ends draw a line that is x cm.
④ Complete the triangle



e) A parallelogram.

- 2 sets of parallel lines

f) A square.

- 4 equal lines, 90°

g) A regular pentagon.

- 5 equal sides