Shapes: Draw 2D Shapes

Aim:	**Success Criteria:**	**Resources:**
Draw 2-D shapes and make 3-D shapes using modelling materials. Recognise 3-D shapes in different orientations and describe them. To draw polygons by joining marked points. DfE Ready to Progress: Draw polygons and identify parallel and perpendicular sides (3G-2)	I can use a ruler to join marked points on a grid. I can mark the vertices of a 2D shape on a grid. I can identify parallel and perpendicular sides of 2D shapes.	Lesson Pack
	Key/New Words: Polygon, vertex, vertices, regular, irregular, quadrilateral, parallel, perpendicular.	**Preparation:** Isometric Dotty Paper and Squared Dotty Paper - as required Differentiated Draw 2D Shapes Activity Sheet – one per child Diving into Mastery Activity Sheets - as required

Prior Learning: It will be helpful if children know the names of the common 2D shapes and have had experience describing and sorting them.

Learning Sequence

	**Remember It:** Using the 2D shapes shown on the Lesson Presentation, the children rehearse naming different 2D shapes, describing how many sides and vertices they have and whether they are regular and irregular.	
	**Complete the Shape:** Use the corresponding slides on the Lesson Presentation to introduce identifying which 2D shape is drawn when vertices are joined on a grid of dots. The examples used are right-angled triangle, rectangle and hexagon. Can the children identify the 2D shape drawn when marked vertices are joined together on a grid?	
	**Shape Drawing:** Use the corresponding slides on the Lesson Presentation to provide an opportunity for the children to draw their own 2D shapes on both Isometric Dotty Paper and Squared Dotty Paper. The activities include drawing any type of rectangle, triangle and pentagon, with the opportunity to discuss the similarities and differences of the shapes drawn with those of their partner. Can the children mark the vertices of a 2D shape on a grid and use a ruler to join the marked points?	
	**Shape Reasoning:** Use the corresponding slides on the Lesson Presentation to develop using reasoning to answer the given questions. The examples bring in revision of parallel and perpendicular lines. Can the children identify parallel and perpendicular sides of 2D shapes?	
	**Drawing 2D Shapes:** The children work independently to complete the differentiated Draw 2D Shapes Activity Sheet.  Children join vertices to draw a square, rectangle and right-angled triangle. They then plot the missing vertex to draw a square, right-angled triangle and pentagon. Finally, they are challenged to draw three different quadrilaterals on an isometric grid.  Children join vertices to draw a hexagon, octagon and kite. They then plot the missing vertex to draw a pentagon, rhombus and square. Finally, they are challenged to draw different quadrilaterals including a kite, parallelogram and trapezium on an isometric grid.  Children join vertices to draw a parallelogram, trapezium and heptagon. They then plot the missing vertices to draw an octagon, parallelogram and trapezium. Finally, they are challenged to draw three different hexagons. They investigate whether it is possible to draw a regular hexagon on the isometric grid.	

Diving into Mastery: Schools using a mastery approach may prefer to use the following as an alternative activity. These sheets might not necessarily be used in a linear way. Some children might begin at the 'Deeper' section and in fact, others may 'dive straight in' to the 'Deepest' section if they have already mastered the skill and are applying this to show their depth of understanding.

Children complete fluency questions related to drawing polygons by joining marked points.

Children answer reasoning questions related to drawing polygons by joining marked points, explaining their answers.

Children work individually or collaboratively on problem-solving questions related to drawing polygons by joining marked points.

Exploreit

Learnit: Children will find this visually exciting Knowledge Organiser a useful tool to support their understanding of shape.

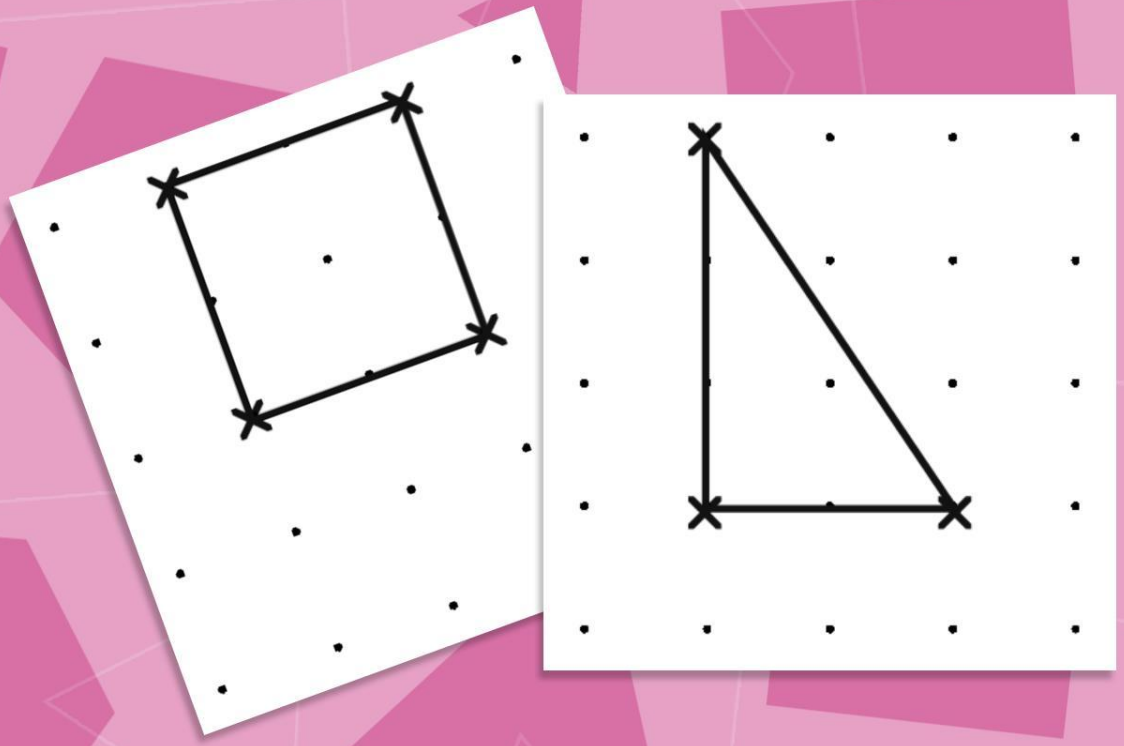
Createit: Link the learning to art and explore artists like Kandinsky who use 2D shapes in their art work.

Dotty Drawit: Children can explore drawing 2D shapes using these different dotty papers.

Maths

Properties of Shapes

Draw 2D Shapes



Aim

- To draw polygons by joining marked points.

Success Criteria

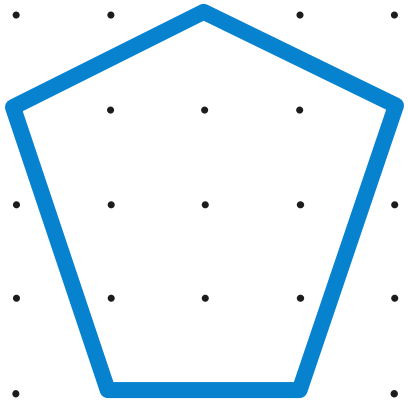
- I can use a ruler to join marked points on a grid.
- I can mark the vertices of a 2D shape on a grid.
- I can identify parallel and perpendicular sides of 2D shapes.

Remember It

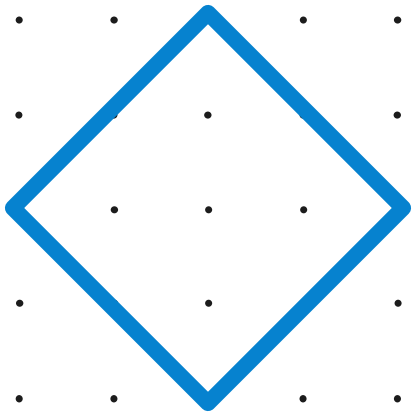
Can you name these 2D shapes?

How many sides and vertices do they have?

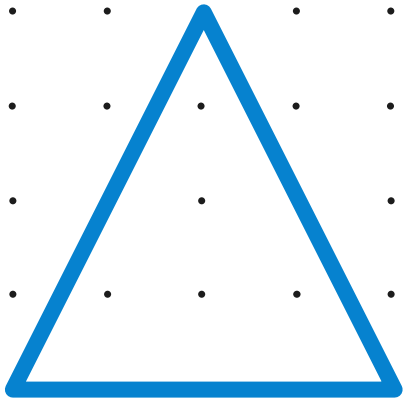
Are they regular or irregular?



irregular pentagon
5 sides and vertices



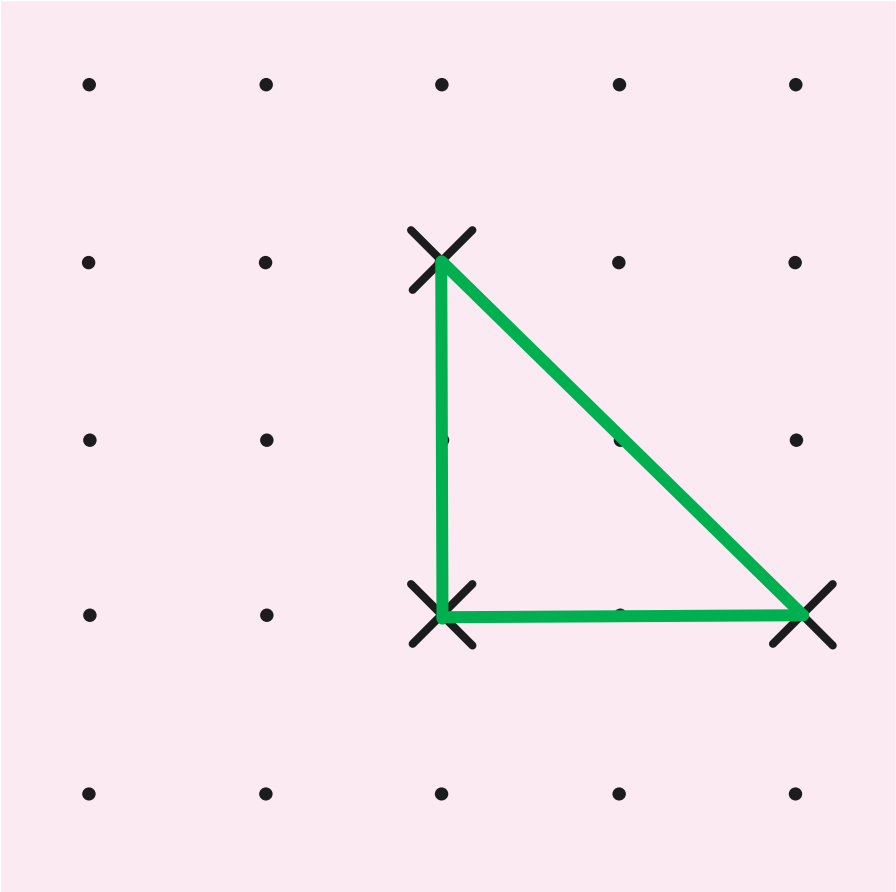
square or
quadrilateral or
regular rectangle
4 sides and vertices



irregular triangle
3 sides and vertices

Do you know the names of any other 2D shapes?

Complete the Shape

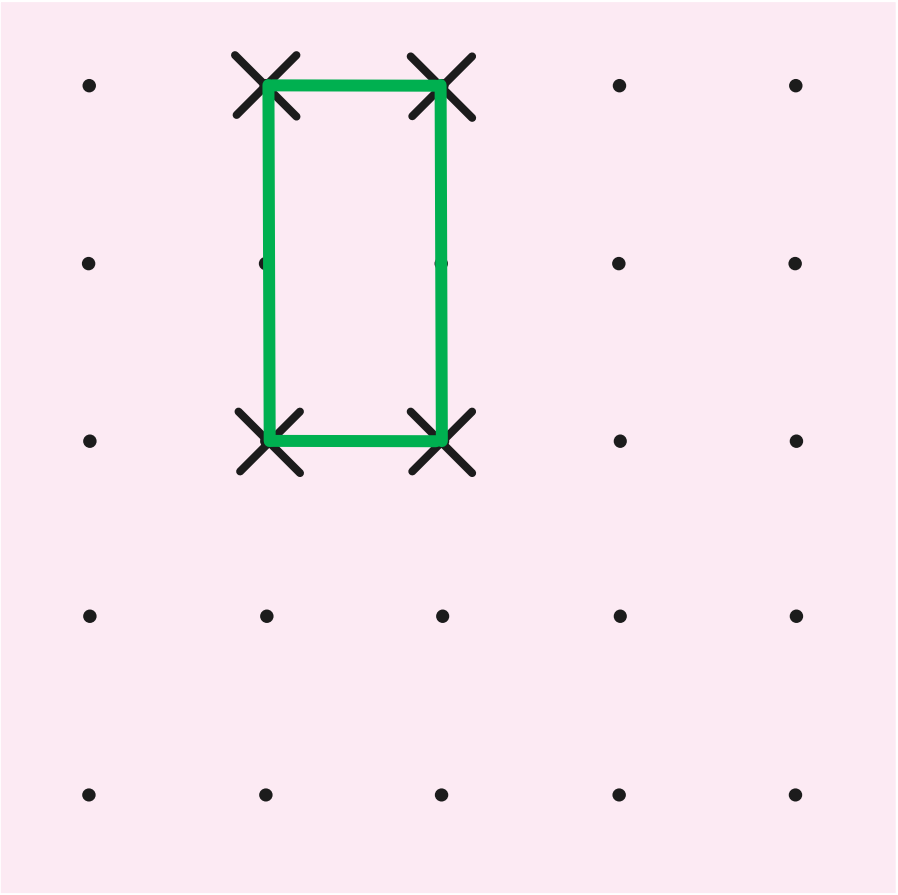


The vertices of a 2D shape are marked on the dotted paper.

What 2D shape will be created when the vertices are joined up?

Triangle

Complete the Shape

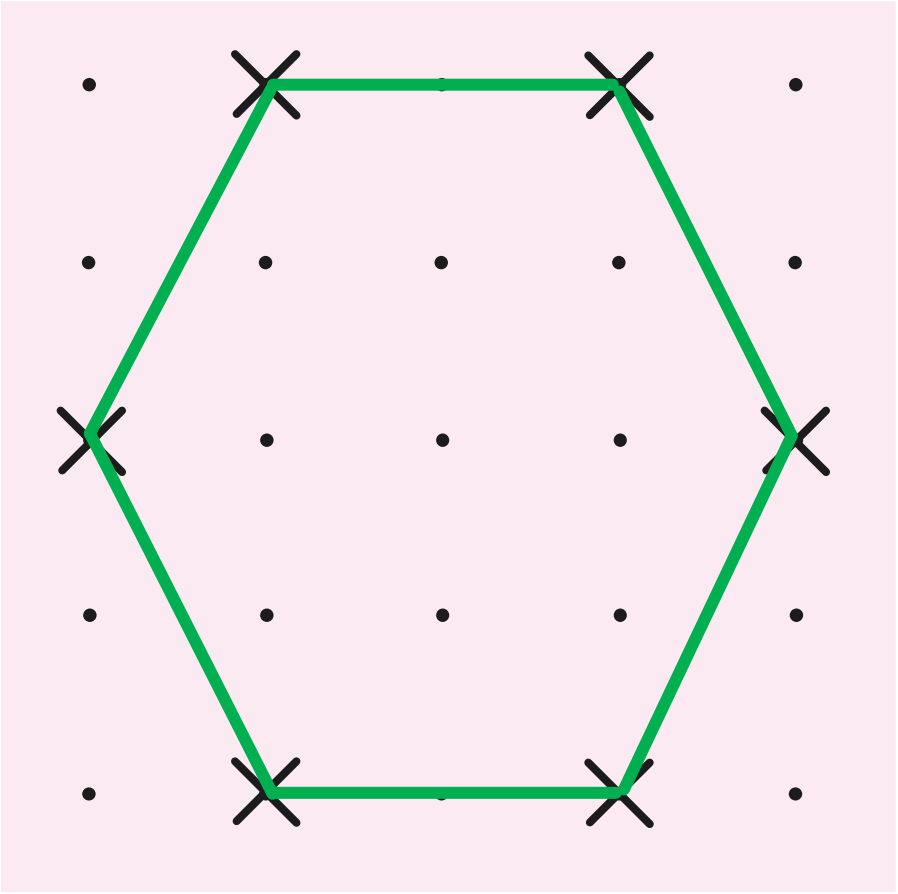


The vertices of a 2D shape are marked on the dotted paper.

What 2D shape will be created when the vertices are joined up?

Rectangle

Complete the Shape



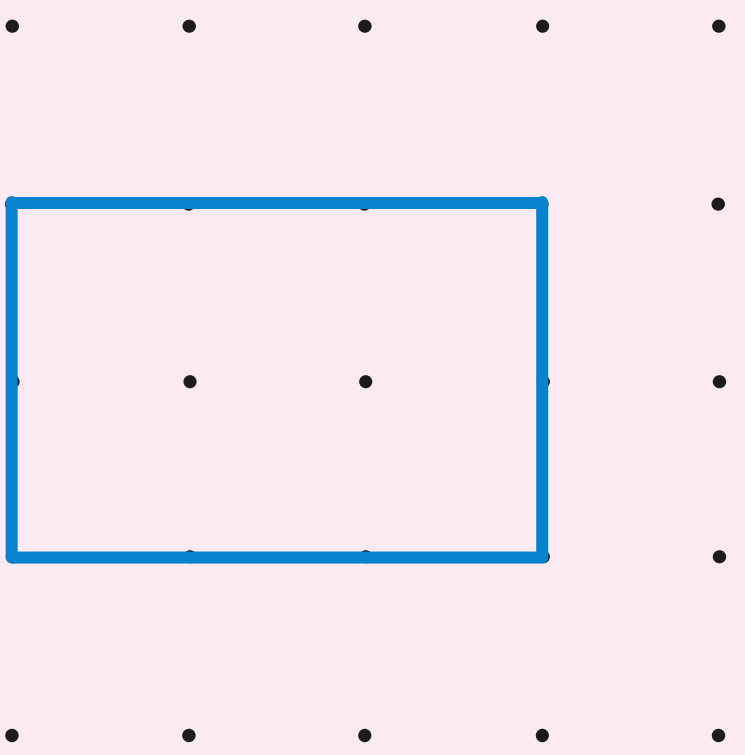
The vertices of a 2D shape are marked on the dotted paper.

What 2D shape will be created when the vertices are joined up?

Hexagon

Shape Drawing

Here is a rectangle drawn on dotted paper.



Can you draw a rectangle on dotted paper?

Tips:

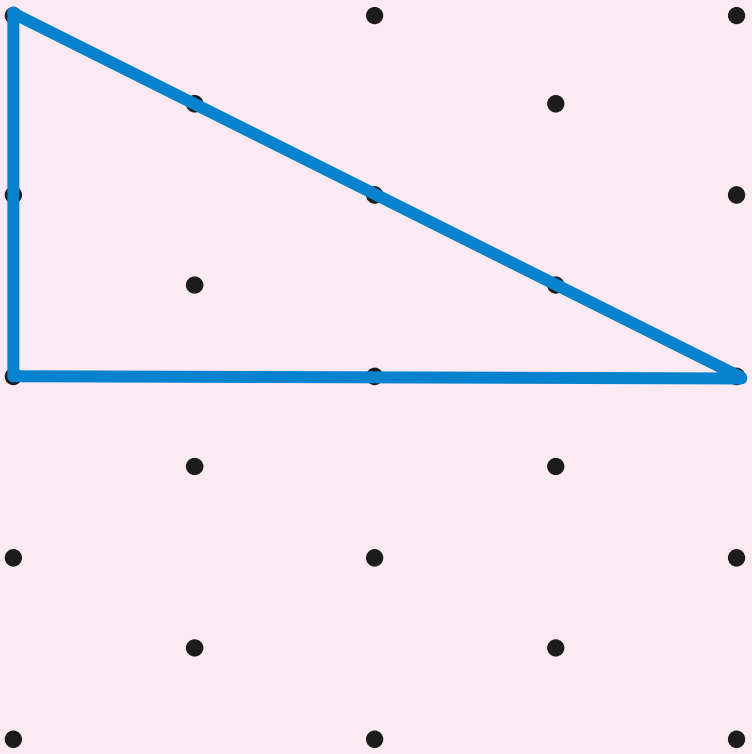
Decide where the first vertex of the shape will be.

Line up your ruler with the dots on the paper.

Holding your ruler still, draw a line from one vertex to the other.

Shape Drawing

Here is a triangle drawn on isometric dotted paper.



Can you draw a triangle on isometric dotted paper?

Tips:

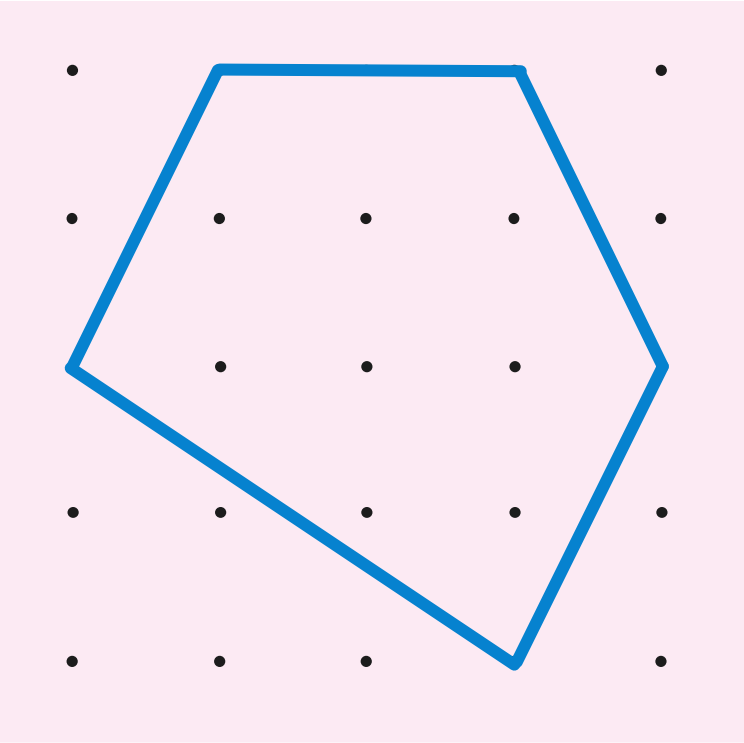
Decide where the first vertex of the shape will be.

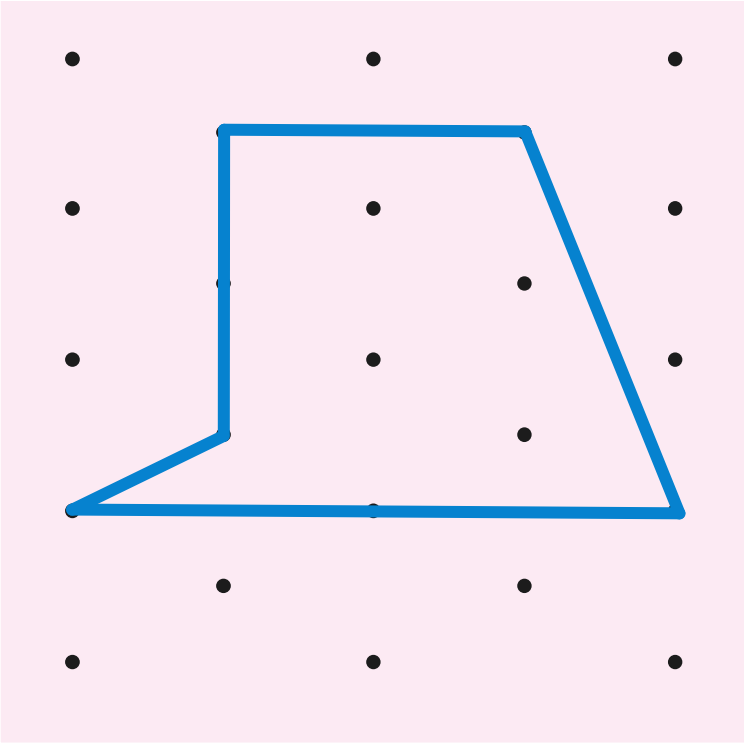
Line up your ruler with the dots on the paper.

Holding your ruler still, draw a line from one vertex to the other.

Shape Drawing

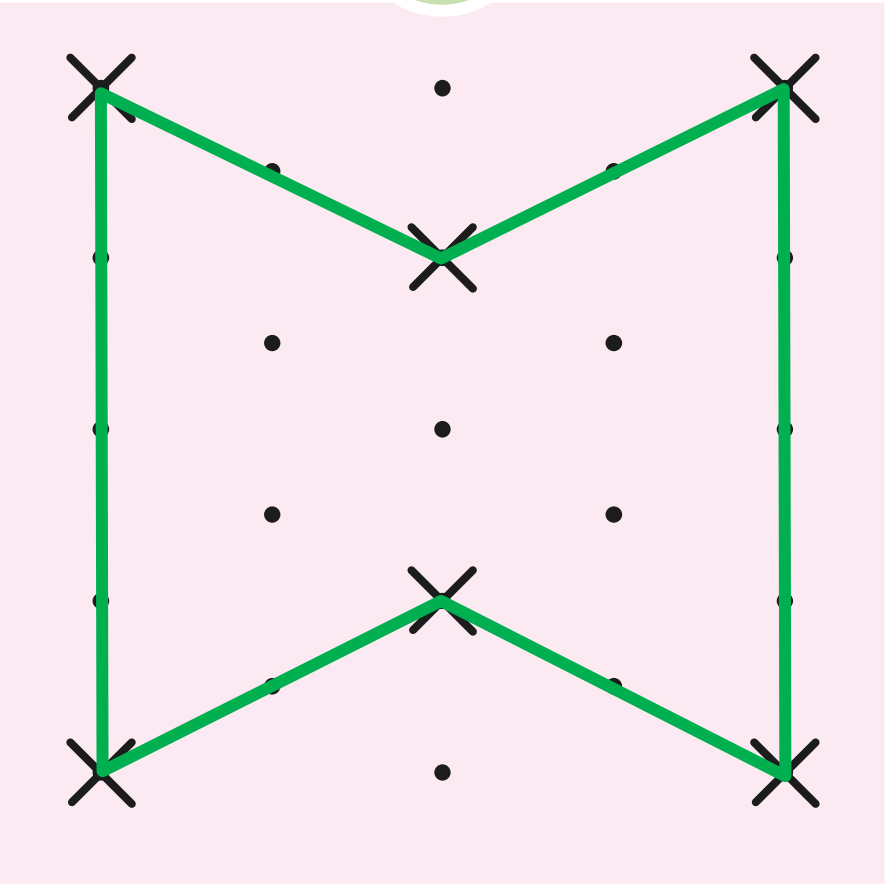
Can you draw a polygon with 5 sides and 5 vertices on both squared and isometric dotted paper? Here are two examples.





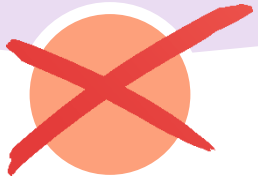
Compare your pentagons to your partner's pentagons. How are they the same? How are they different?

Will these vertices create a hexagon when joined together with a ruler?



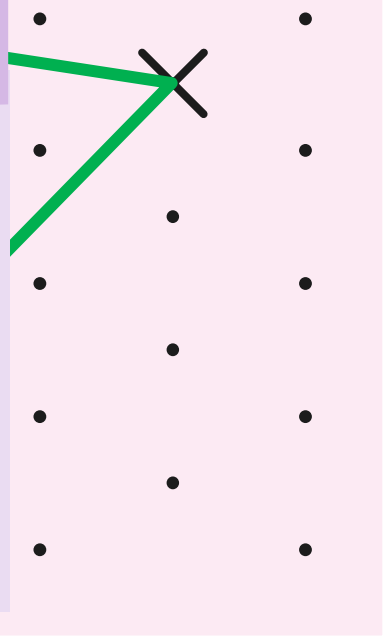
Shape Reasoning

Will these vertices create a 2D shape with parallel sides when joined together with a ruler?



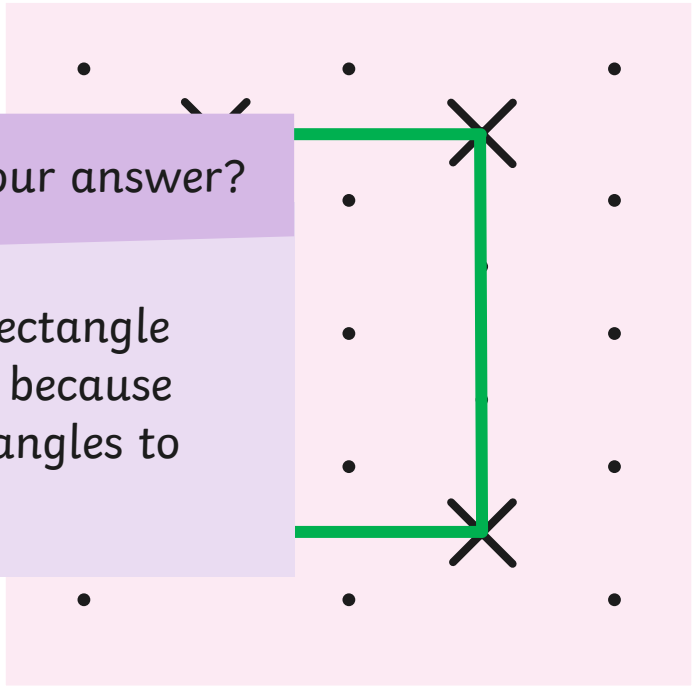
Can you explain your answer?

Parallel lines are always the same distance apart and will never meet no matter how far we extend them. The sides of this triangle are not parallel.



Shape Reasoning

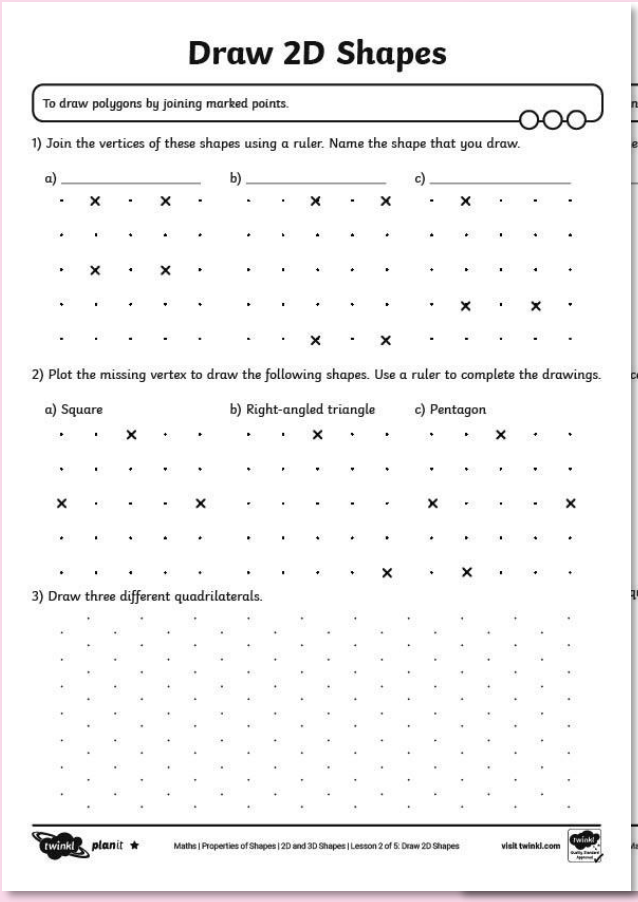
Will these vertices create a 2D shape with perpendicular sides when joined together with a ruler?



Can you explain your answer?

The sides of this rectangle are perpendicular because they are at right angles to each other.

Draw 2D Shapes



Draw 2D Shapes

To draw polygons by joining marked points.

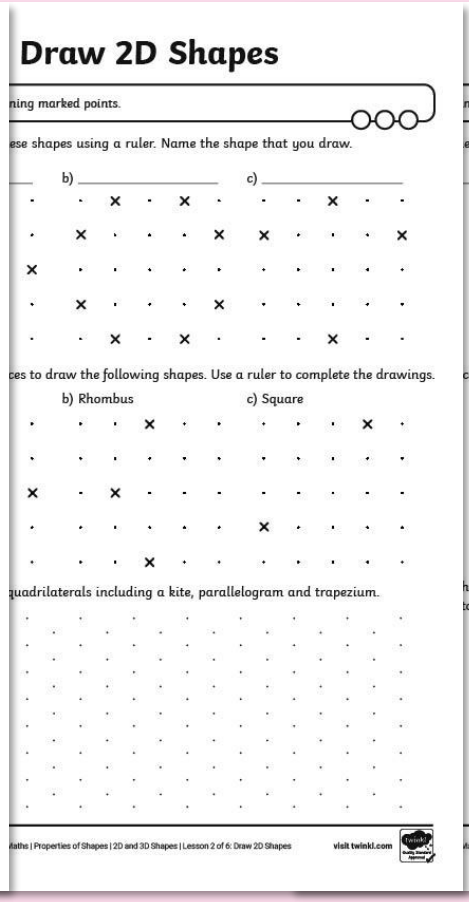
1) Join the vertices of these shapes using a ruler. Name the shape that you draw.

a) _____ b) _____ c) _____

2) Plot the missing vertex to draw the following shapes. Use a ruler to complete the drawings.

a) Square b) Right-angled triangle c) Pentagon

3) Draw three different quadrilaterals.



Draw 2D Shapes

ning marked points.

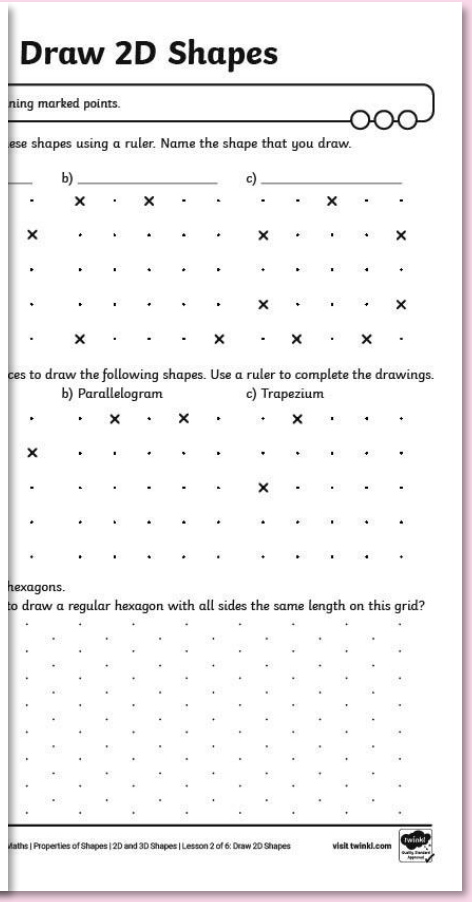
ese shapes using a ruler. Name the shape that you draw.

b) _____ c) _____

ces to draw the following shapes. Use a ruler to complete the drawings.

b) Rhombus c) Square

quadrilaterals including a kite, parallelogram and trapezium.



Draw 2D Shapes

ning marked points.

ese shapes using a ruler. Name the shape that you draw.

b) _____ c) _____

ces to draw the following shapes. Use a ruler to complete the drawings.

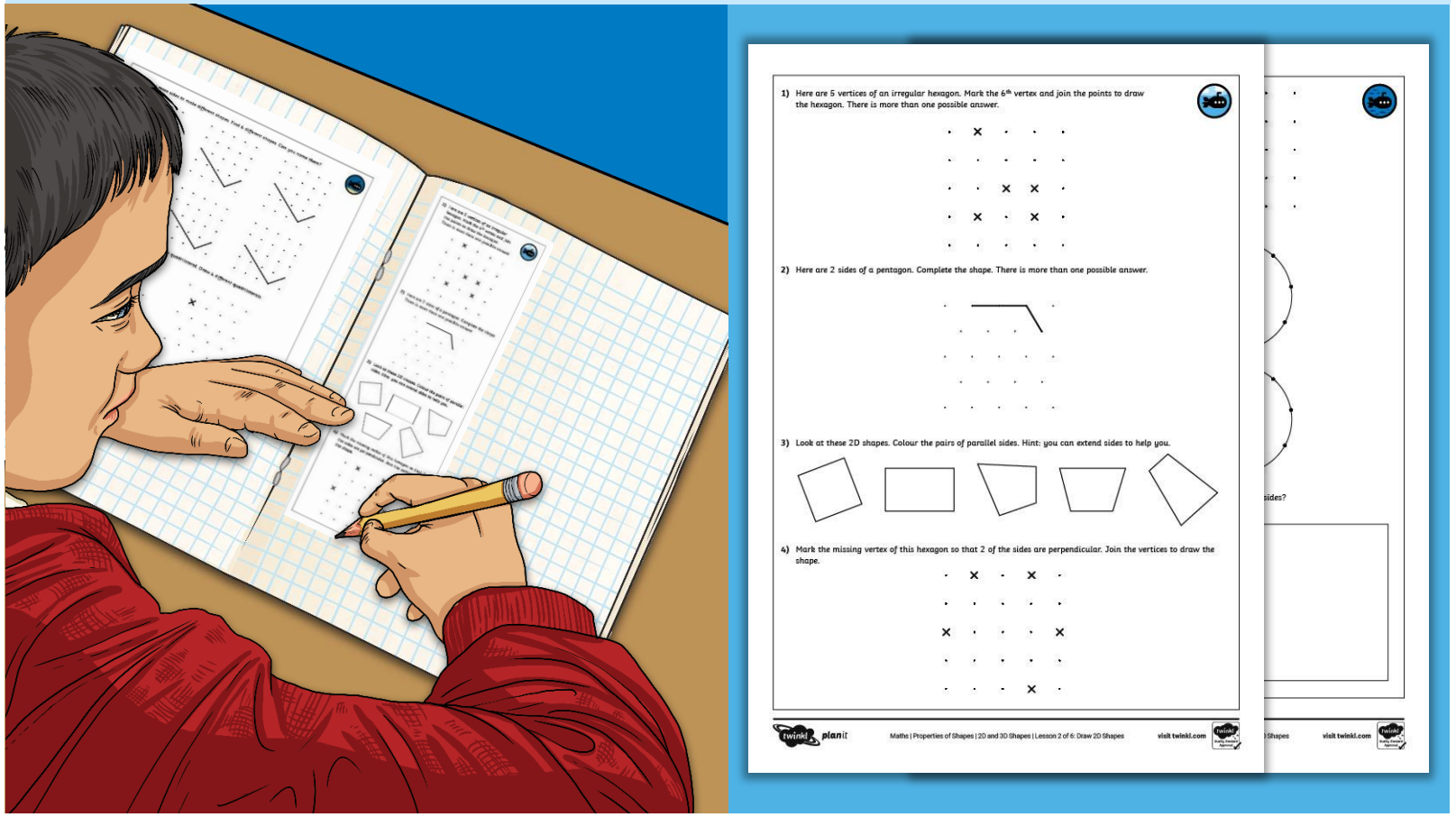
b) Parallelogram c) Trapezium

hexagons.

o draw a regular hexagon with all sides the same length on this grid?

Diving into Mastery

Dive in by completing your own activity!



Aim

- To draw polygons by joining marked points.

Success Criteria

- I can use a ruler to join marked points on a grid.
- I can mark the vertices of a 2D shape on a grid.
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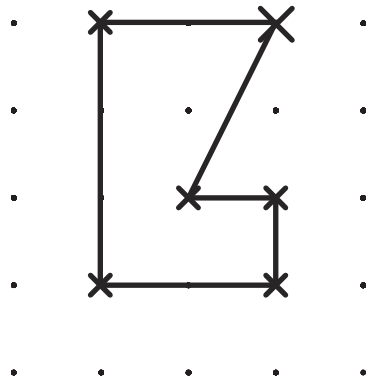
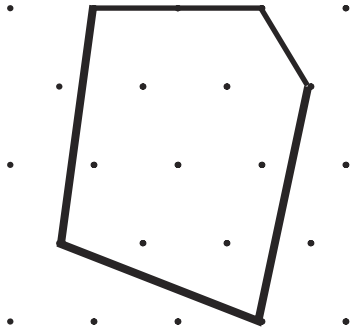
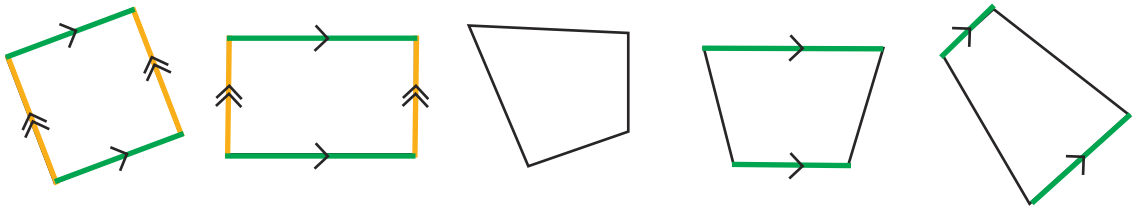
1) Open-ended question. One possible answer:



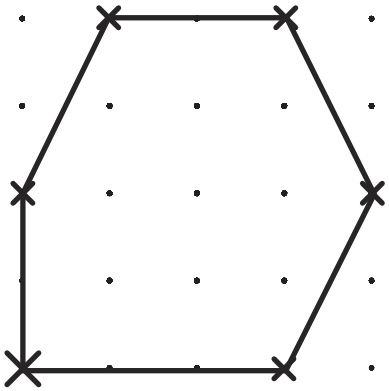
2) Open-ended question. One possible answer:



3)



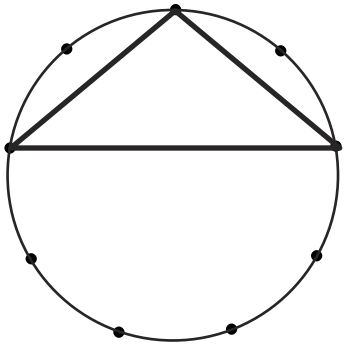
4) Open-ended question. One possible answer:



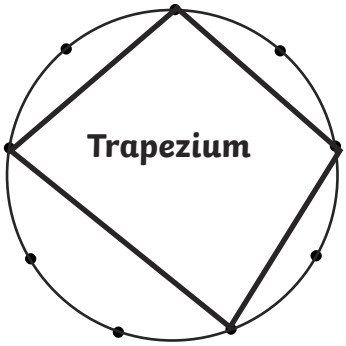
1) 6 points could make a hexagon, but that they could also be in a straight line to create a line in a triangle or quadrilateral. Each point needs to be a vertex to make a hexagon.

2)

a) Open-ended question. One possible answer:



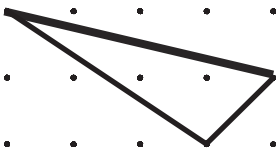
b) Open-ended question. One possible answer:



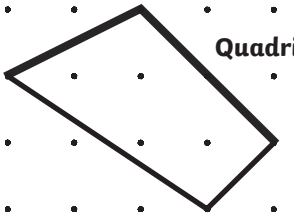
3) Open-ended question. One possible answer is this parallelogram:

1) Open-ended question. Some possible answers:

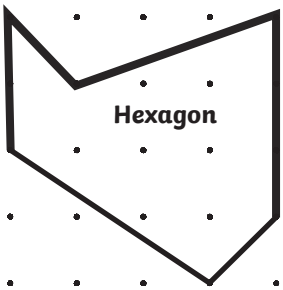
Right-angled triangle



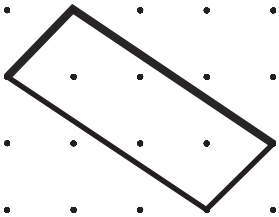
Quadrilateral



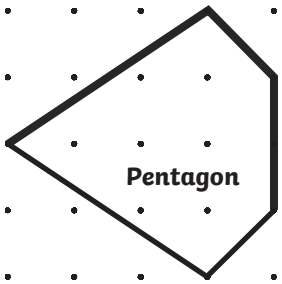
Hexagon



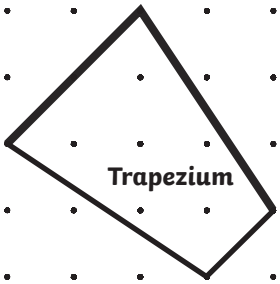
Parallelogram



Pentagon

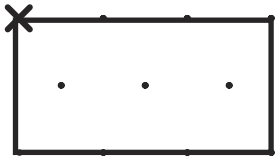


Trapezium

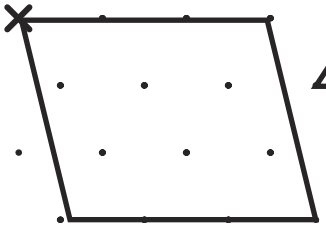


2) Open-ended question. Some possible answers:

Rectangle

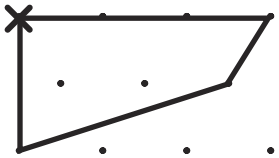


Parallelogram

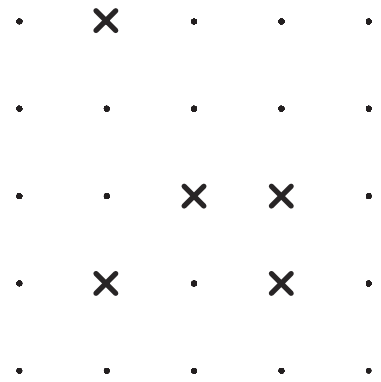


Trapezium

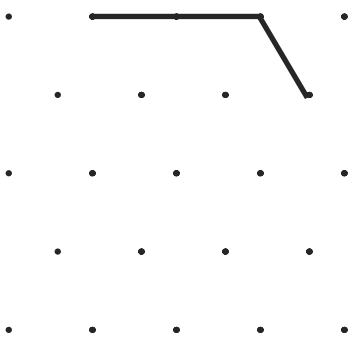
Irregular Quadrilateral



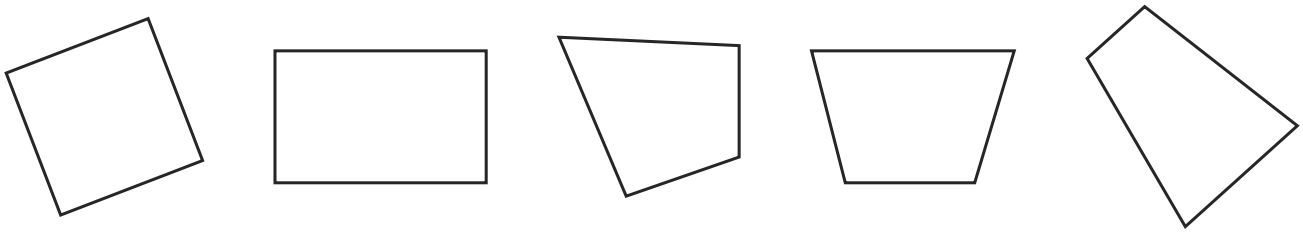
1) Here are 5 vertices of an irregular hexagon. Mark the 6th vertex and join the points to draw the hexagon. There is more than one possible answer.



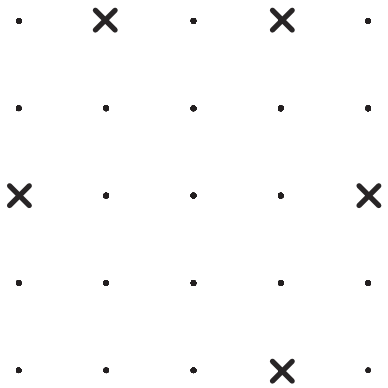
2) Here are 2 sides of a pentagon. Complete the shape. There is more than one possible answer.



3) Look at these 2D shapes. Colour the pairs of parallel sides. Hint: you can extend sides to help you.



4) Mark the missing vertex of this hexagon so that 2 of the sides are perpendicular. Join the vertices to draw the shape.



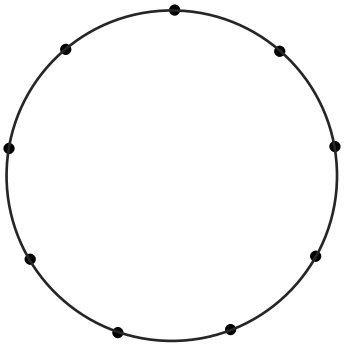
1)

If I plot 6 points on a grid, I will always make a hexagon.

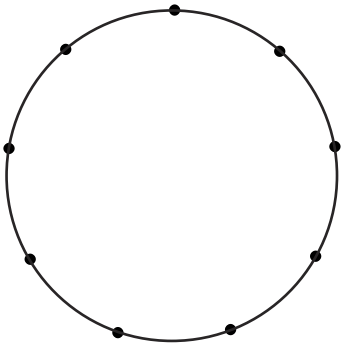
Do you agree with this statement? Prove it.

2)

I can join dots on this circle to draw a triangle.

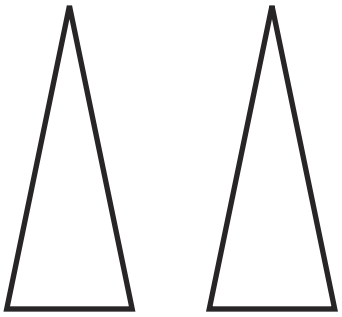


a) Do you agree with this statement? Prove it.

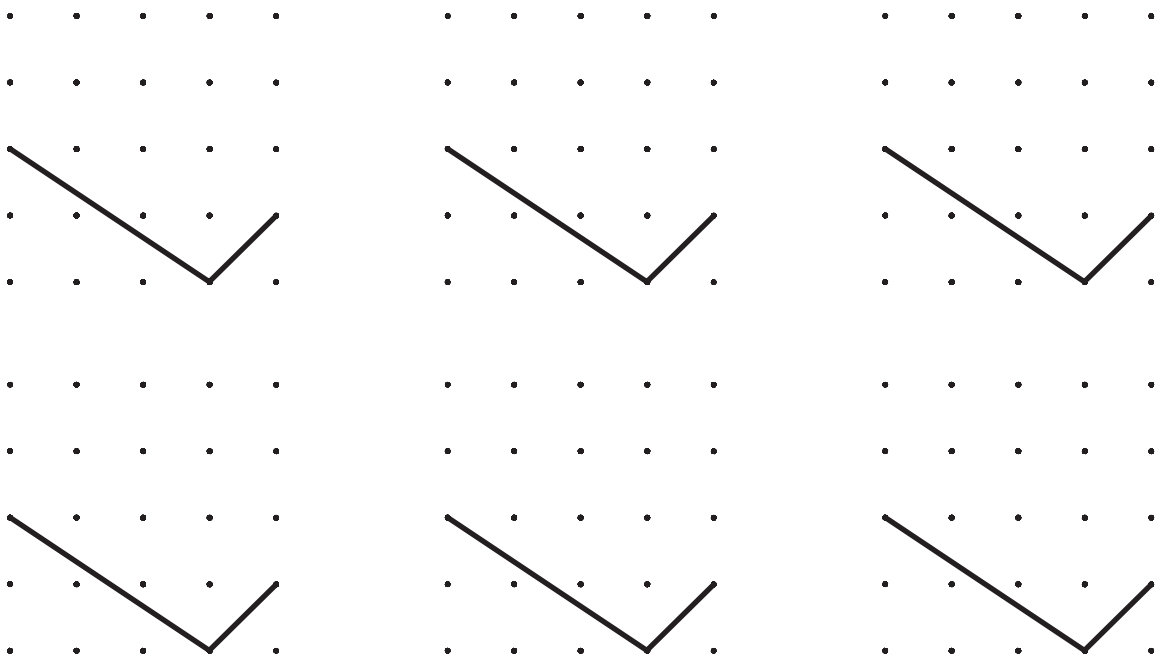


b) What other 2D shapes can you draw by joining the dots on the circle?

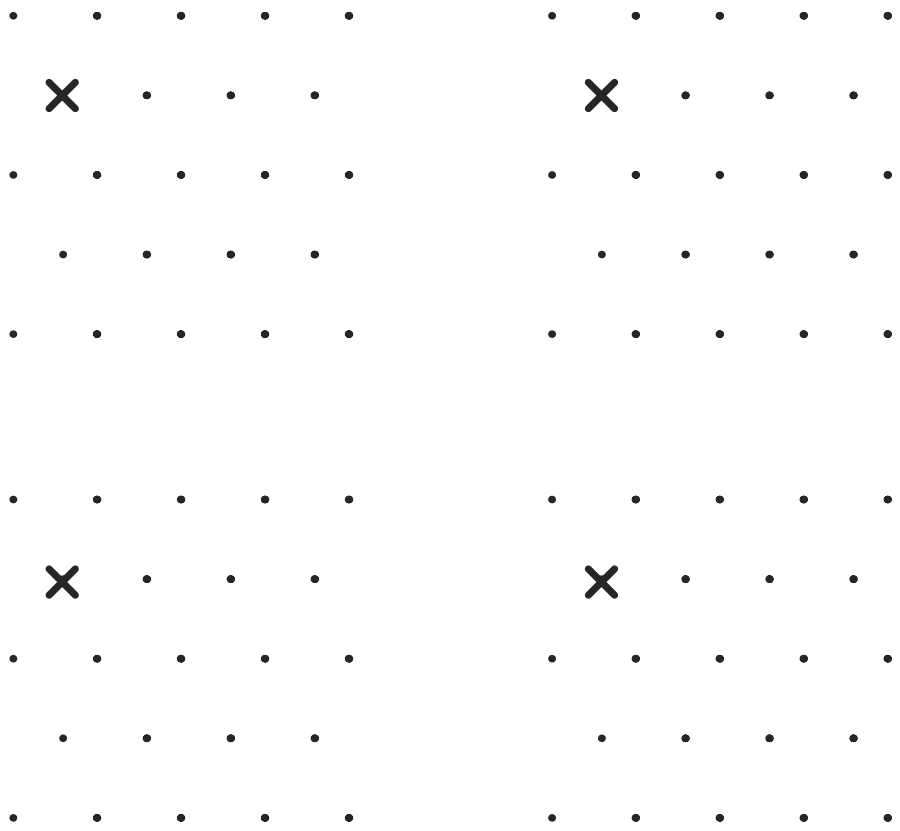
3) Can these 2 triangles be joined together to create a quadrilateral with parallel sides? Prove it. You can cut the triangles out.



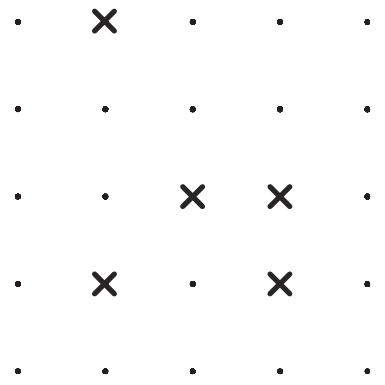
1) Add 1 or more sides to make different shapes. Find 6 different shapes. Can you name them?



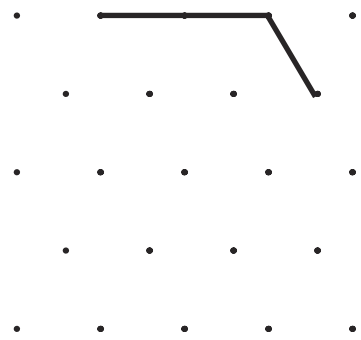
2) The vertex plotted on the grid is the vertex of a quadrilateral. Draw 4 different quadrilaterals. Can you name them?



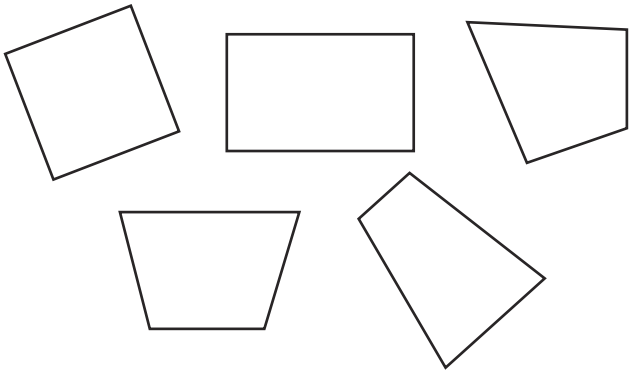
1) Here are 5 vertices of an irregular hexagon. Mark the 6th vertex and join the points to draw the hexagon.
There is more than one possible answer.



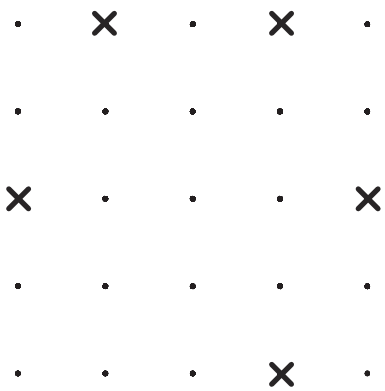
2) Here are 2 sides of a pentagon. Complete the shape.
There is more than one possible answer.



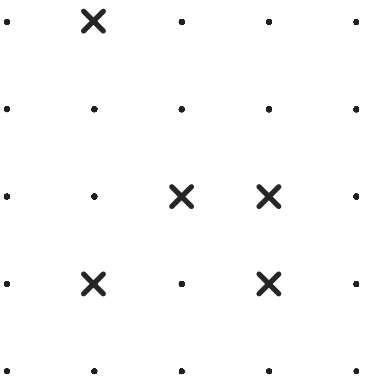
3) Look at these 2D shapes. Colour the pairs of parallel sides. Hint: you can extend sides to help you.



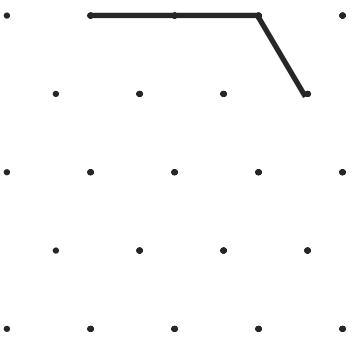
4) Mark the missing vertex of this hexagon so that 2 of the sides are perpendicular. Join the vertices to draw the shape.



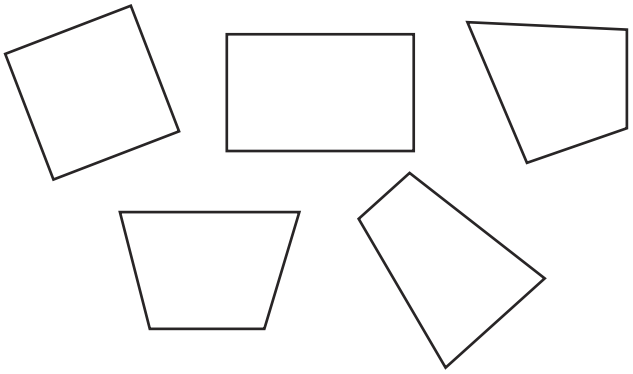
1) Here are 5 vertices of an irregular hexagon. Mark the 6th vertex and join the points to draw the hexagon.
There is more than one possible answer.



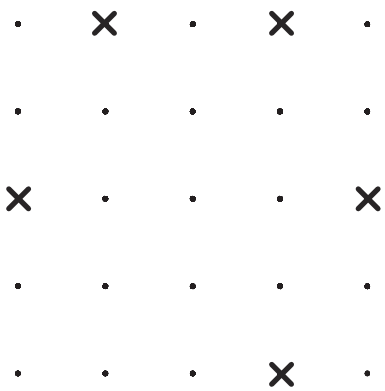
2) Here are 2 sides of a pentagon. Complete the shape.
There is more than one possible answer.



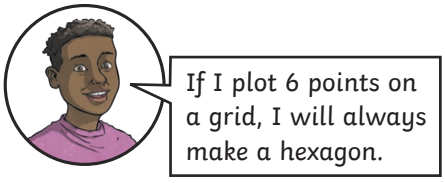
3) Look at these 2D shapes. Colour the pairs of parallel sides. Hint: you can extend sides to help you.



4) Mark the missing vertex of this hexagon so that 2 of the sides are perpendicular. Join the vertices to draw the shape.

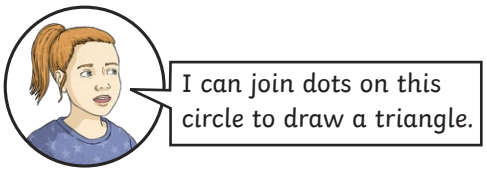


1)

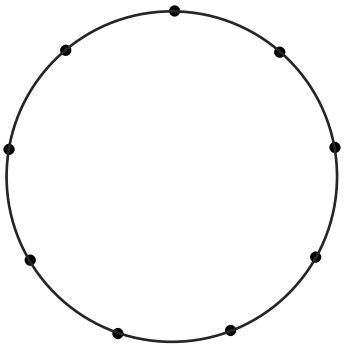


Do you agree with this statement? Prove it.

2)

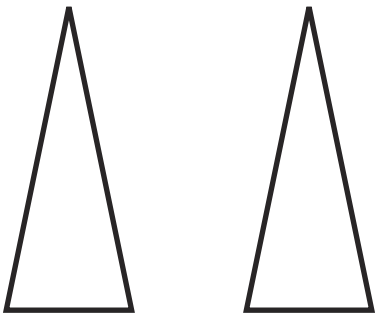


a) Do you agree with this statement? Prove it.



b) What other 2D shapes can you draw by joining the dots on the circle?

3) Can these 2 triangles be joined together to create a quadrilateral with parallel sides? Prove it.
You can cut the triangles out.



1)

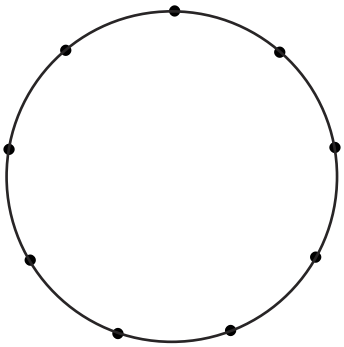
If I plot 6 points on a grid, I will always make a hexagon.

Do you agree with this statement? Prove it.

2)

I can join dots on this circle to draw a triangle.

a) Do you agree with this statement? Prove it.



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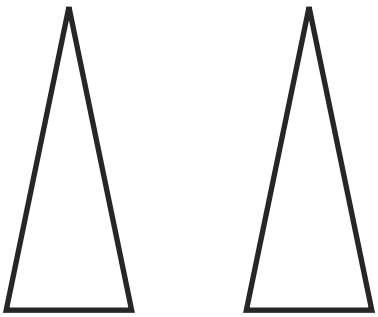
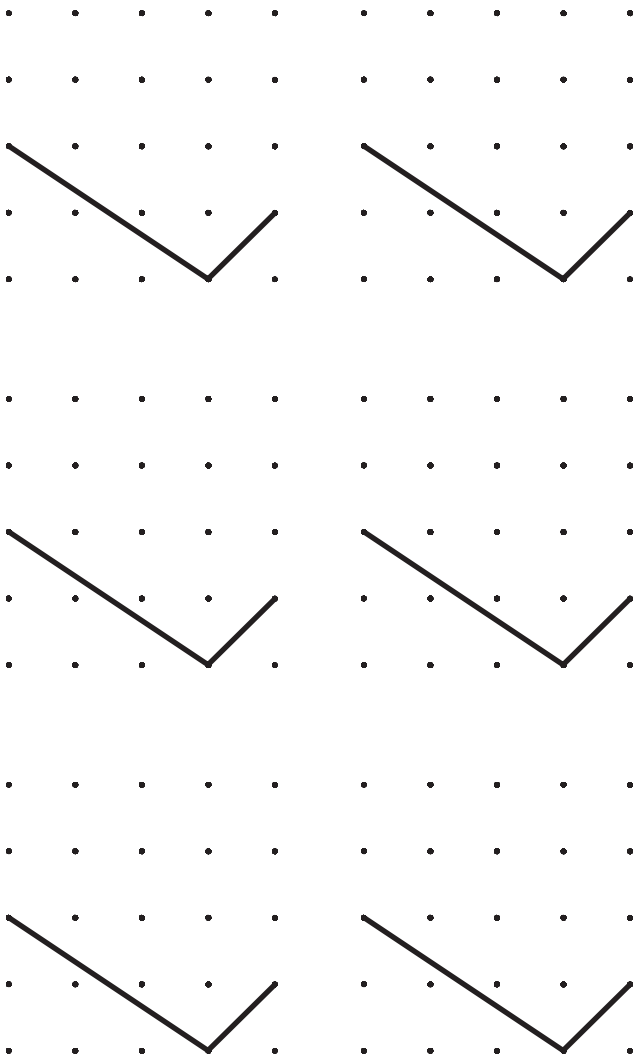
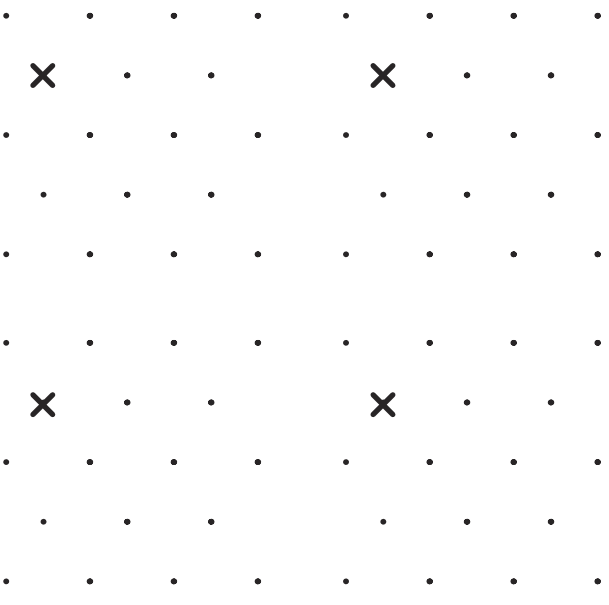


1) Add 1 or more sides to make different shapes. Find 6 different shapes. Can you name them?



2) The vertex plotted on the grid is the vertex of a quadrilateral. Draw 4 different quadrilaterals. Can you name them?



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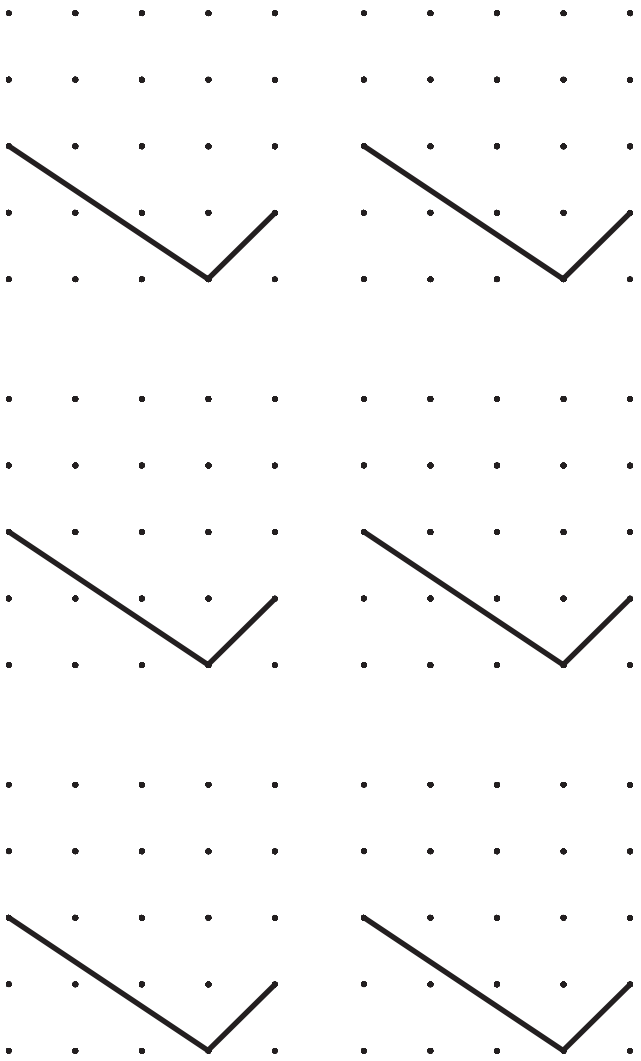

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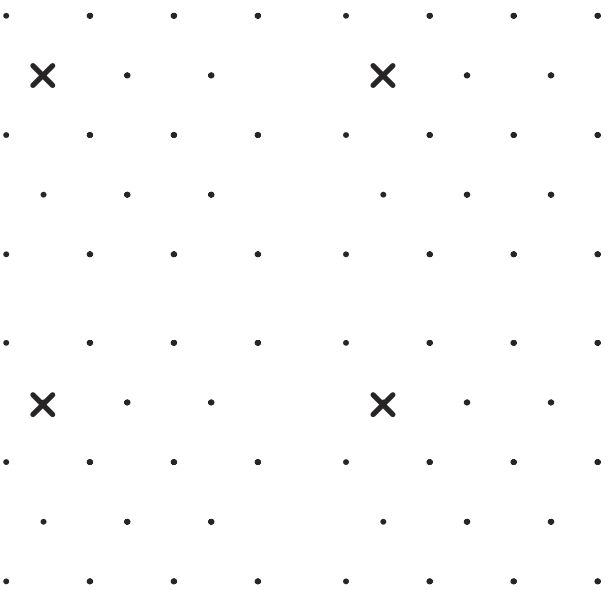
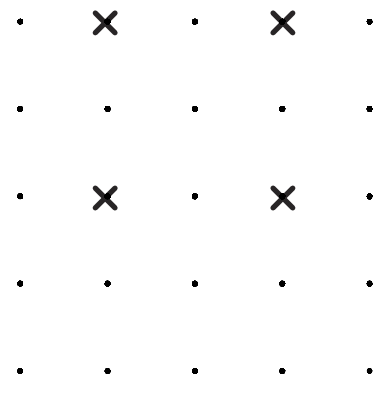


Draw 2D Shapes

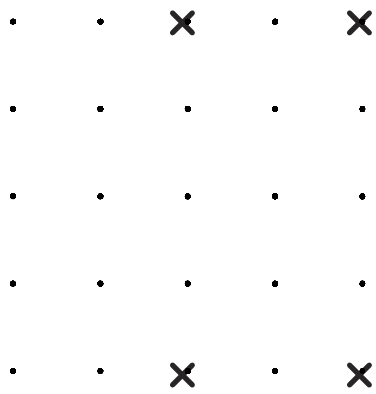
To draw polygons by joining marked points.

1) Join the vertices of these shapes using a ruler. Name the shape that you draw.

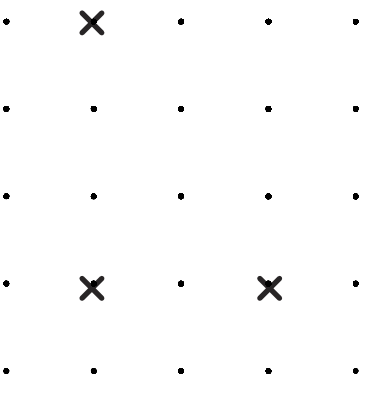
a) _____



b) _____

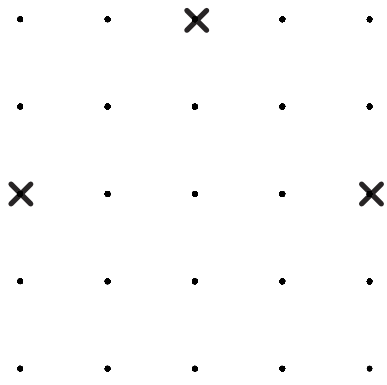


c) _____

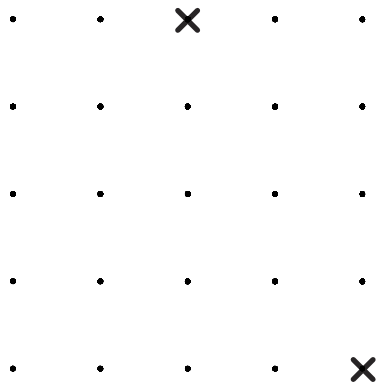


2) Plot the missing vertex to draw the following shapes. Use a ruler to complete the drawings.

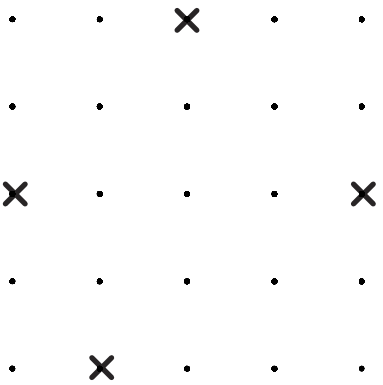
a) Square



b) Right-angled triangle



c) Pentagon



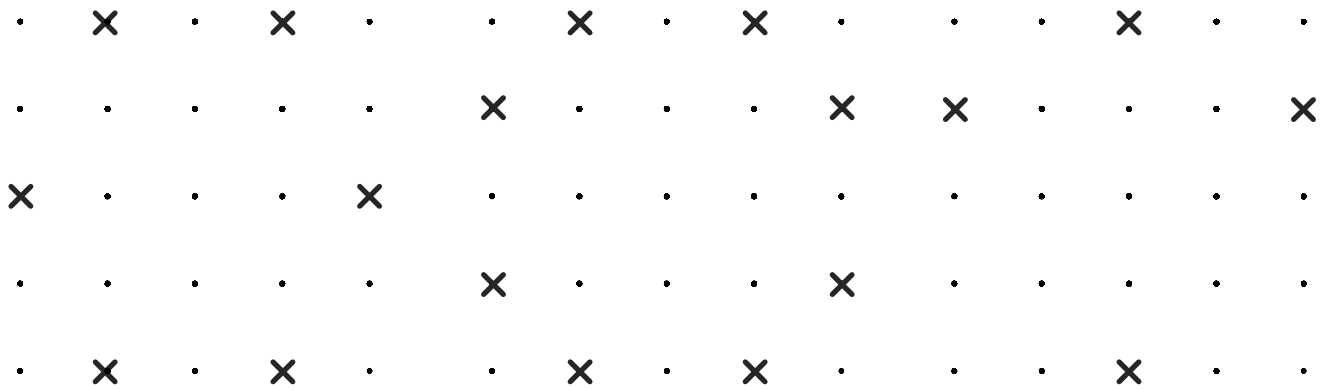
3) Draw three different quadrilaterals.

Draw 2D Shapes

To draw polygons by joining marked points.

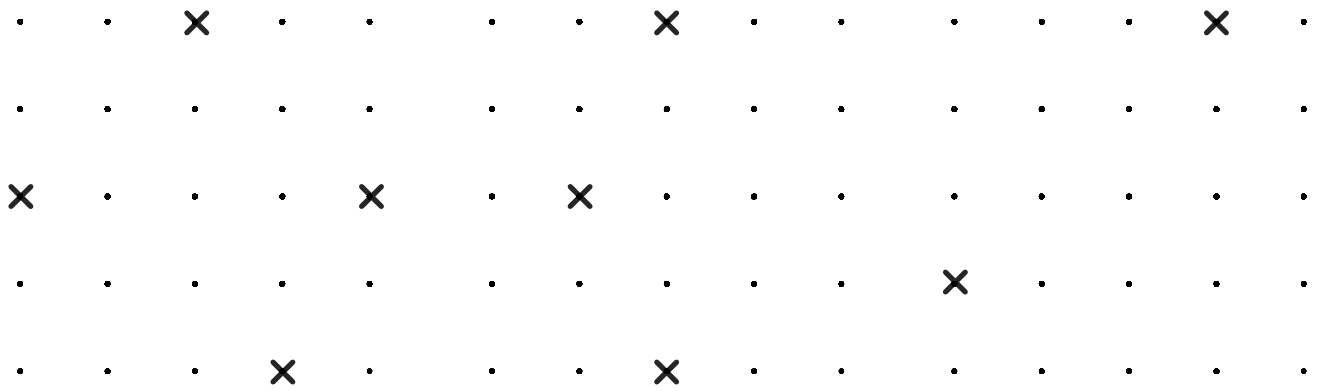
1) Join the vertices of these shapes using a ruler. Name the shape that you draw.

a) _____ b) _____ c) _____



2) Plot the missing vertices to draw the following shapes. Use a ruler to complete the drawings.

a) Pentagon b) Rhombus c) Square



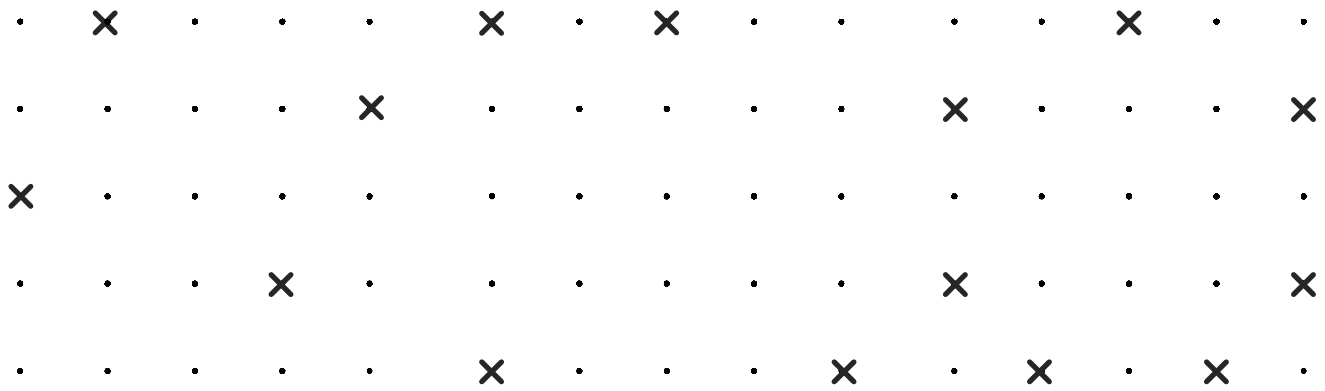
3) Draw three different quadrilaterals including a kite, parallelogram and trapezium.

Draw 2D Shapes

To draw polygons by joining marked points.

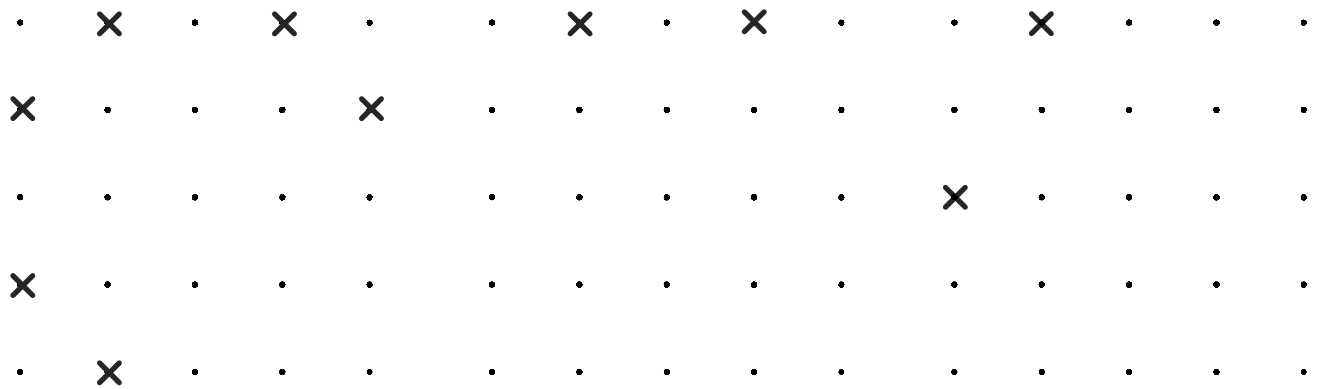
1) Join the vertices of these shapes using a ruler. Name the shape that you draw.

a) _____ b) _____ c) _____



2) Plot the missing vertices to draw the following shapes. Use a ruler to complete the drawings.

a) Octagon b) Parallelogram c) Trapezium



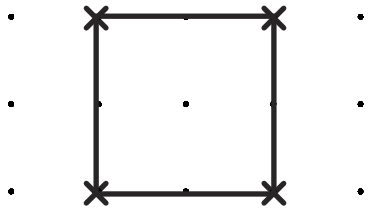
3) Draw three different hexagons.

Challenge: is it possible to draw a regular hexagon with all sides the same length on this grid?

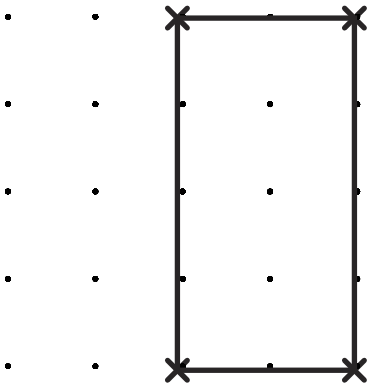
Draw 2D Shapes **Answers**

1) Join the vertices of these shapes using a ruler. Name the shape that you draw.

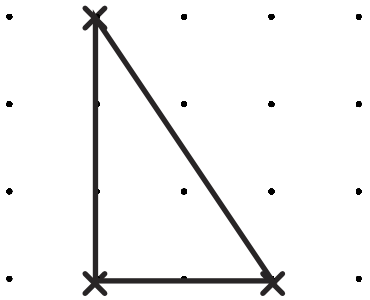
a) **Square**



b) **Rectangle**

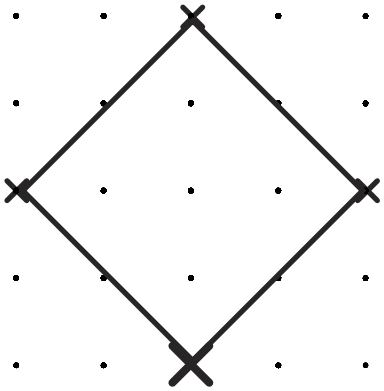


c) **Triangle**

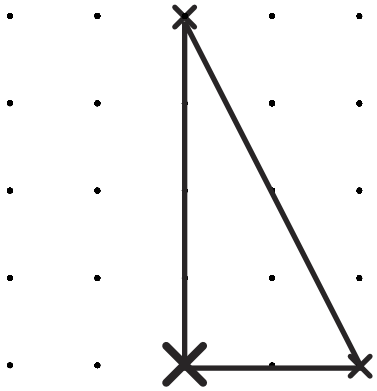


2) Plot the missing vertex to draw the following shapes. Use a ruler to complete the drawings.

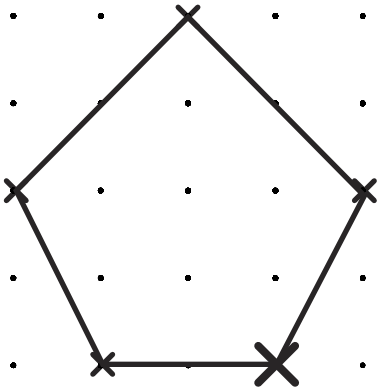
a) Square



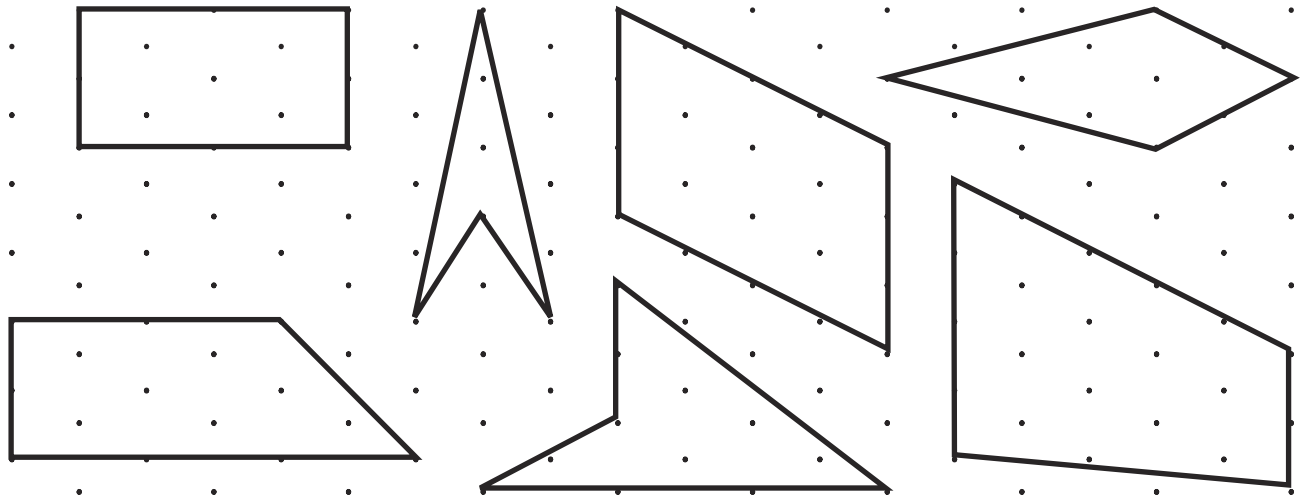
b) Right-angled triangle



c) Pentagon



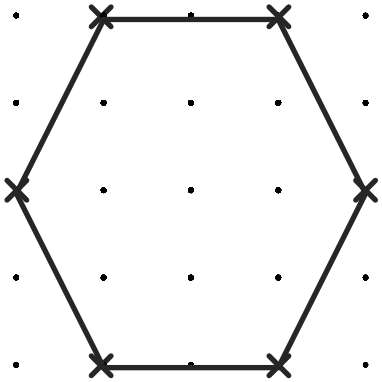
3) Draw three different quadrilaterals. **Open-ended question. Many possible answers, including:**



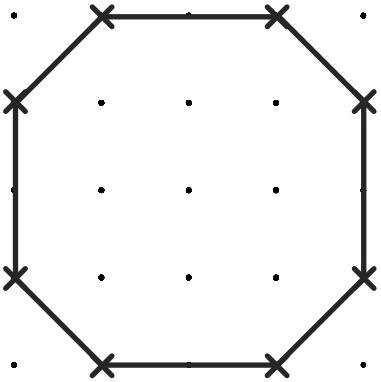
Draw 2D Shapes **Answers**

1) Join the vertices of these shapes using a ruler. Name the shape that you draw.

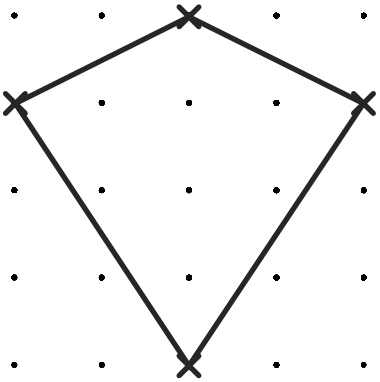
a) **Hexagon**



b) **Octagon**

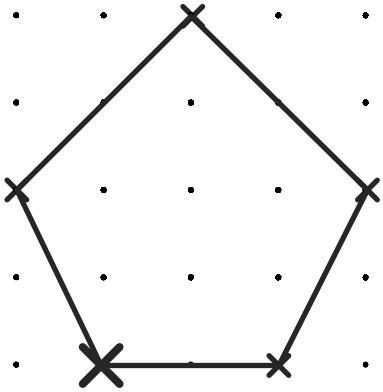


c) **Kite**

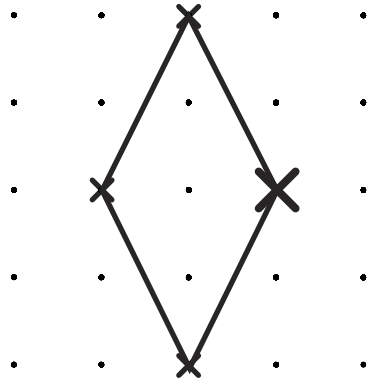


2) Plot the missing vertices to draw the following shapes. Use a ruler to complete the drawings.

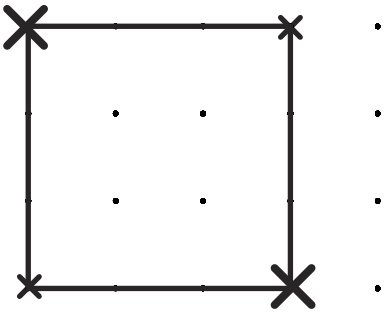
a) Pentagon



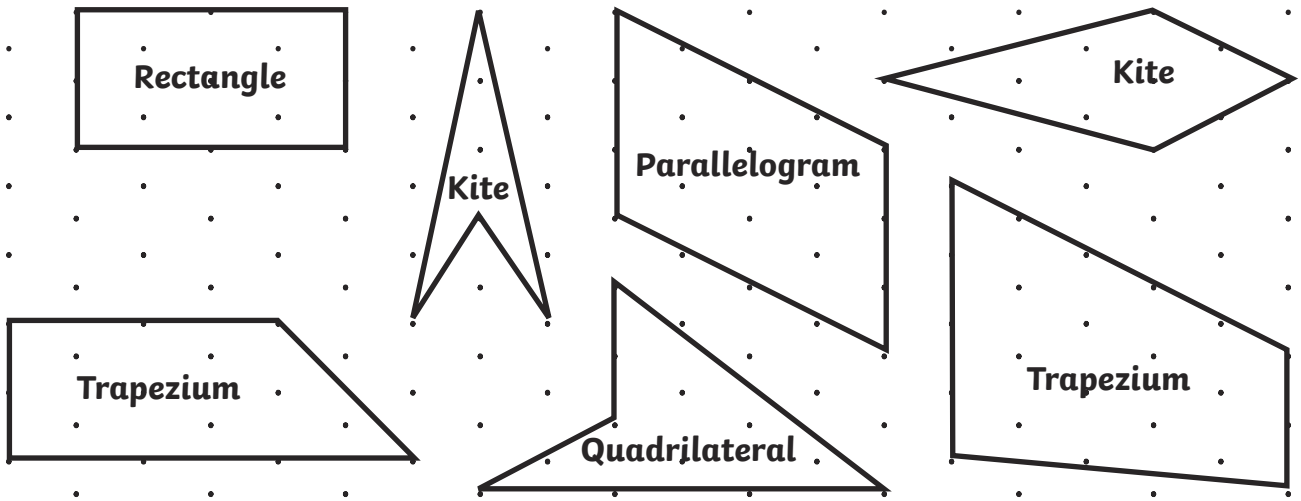
b) Rhombus



c) Square



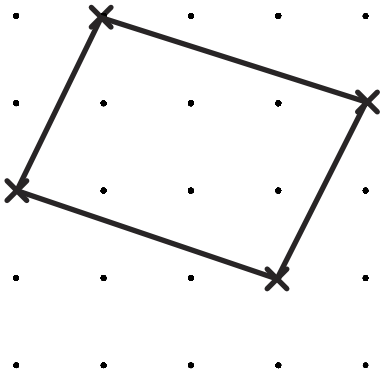
3) Draw three different quadrilaterals including a kite, parallelogram and trapezium. **Open-ended question. Many possible answers, including:**



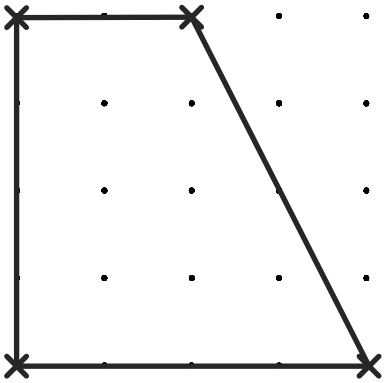
Draw 2D Shapes **Answers**

1) Join the vertices of these shapes using a ruler. Name the shape that you draw.

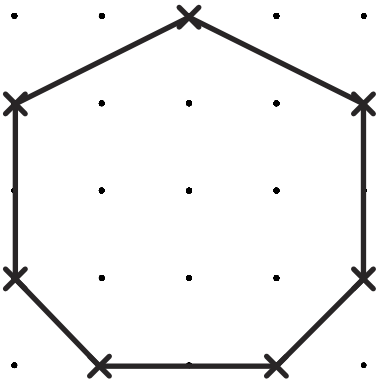
a) **Parallelogram**



b) **Trapezium**

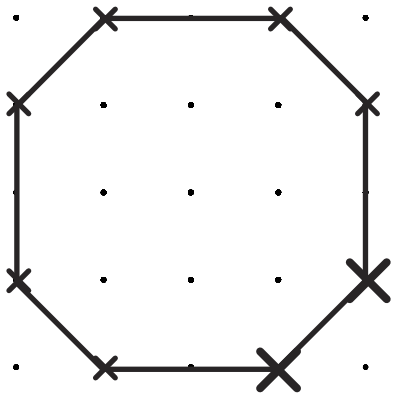


c) **Heptagon**

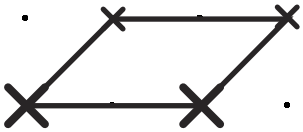


2) Plot the missing vertices to draw the following shapes. Use a ruler to complete the drawings.

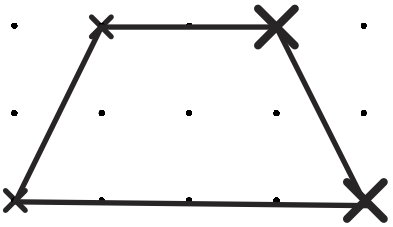
a) Octagon



b) Parallelogram



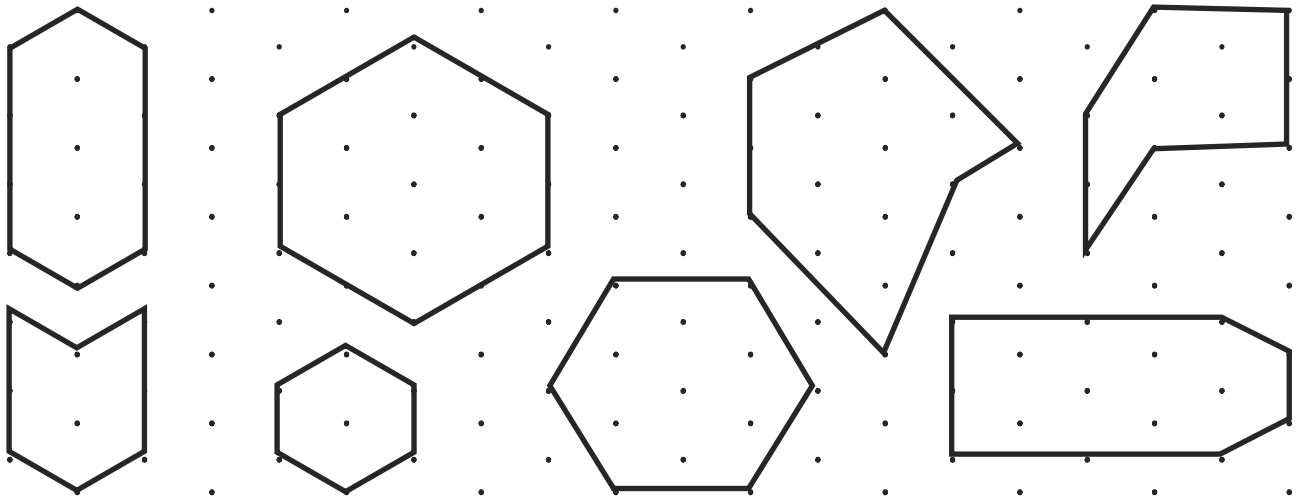
c) Trapezium



3) Draw three different hexagons.

Challenge: is it possible to draw a regular hexagon with all sides the same length on this grid?

Open-ended question: example answers provided. If children have labelled any hexagons as regular, they should measure to check that all the sides are the same length.



Isometric Dotty Paper

Squared Dotty Paper

Shapes | Draw 2D Shapes

To draw polygons by joining marked points.		
I can use a ruler to join marked points on a grid.		
I can mark the vertices of a 2D shape on a grid.		
I can identify parallel and perpendicular sides of 2D shapes.		

Shapes | Draw 2D Shapes

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Shapes | Draw 2D Shapes

To draw polygons by joining marked points.		
I can use a ruler to join marked points on a grid.		
I can mark the vertices of a 2D shape on a grid.		
I can identify parallel and perpendicular sides of 2D shapes.		

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