

Reasoning and Problem Solving – Angles in Quadrilaterals

National Curriculum Objectives:

Mathematics Year 6: (6G3a) [Draw 2-D shapes using given dimensions and angles](#)

Mathematics Year 6: (6G2a) [Compare and classify geometric shapes based on their properties and sizes](#)

Mathematics Year 6: (6G4a) [Find unknown angles in any triangles, quadrilaterals, and regular polygons](#)

Differentiation:

Questions 1, 4 and 7 (Problem Solving)

Developing Use knowledge of quadrilaterals to create 2 separate shapes on a given geoboard.

Expected Use knowledge of quadrilaterals to create 3 separate shapes on a given geoboard.

Greater Depth Use knowledge of quadrilaterals to create 4 separate shapes on a given geoboard.

Questions 2, 5 and 8 (Reasoning)

Developing Answer simple true or false statements, regarding simple quadrilaterals.

Expected Answer simple true or false statements, regarding more complex quadrilaterals.

Greater Depth Answer more complex true or false statements, regarding any regular quadrilateral.

Questions 3, 6 and 9 (Problem Solving)

Developing Use a clear description to identify a shape from a choice of 2 given shapes. Calculate 2 missing angles, supplementary angles are given.

Expected Use a clear description to identify a shape from a choice of 3 given shapes. Calculate 3 missing angles, supplementary angles are given.

Greater Depth Use a clear description to identify a shape from a choice of 3 given shapes. Calculate a number of missing angles, supplementary and unhelpful angles given.

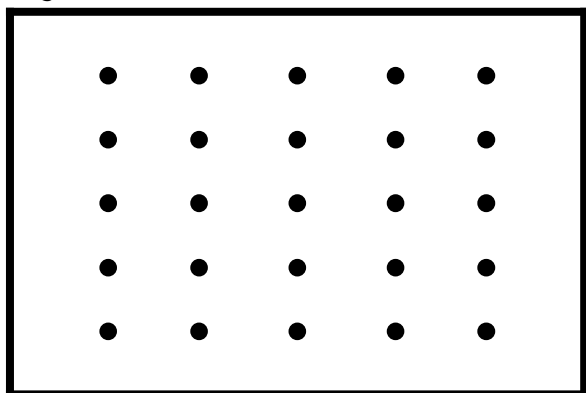
More [Year 6 Properties of Shapes](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

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Reasoning and Problem Solving – Angles in Quadrilaterals

1a. Draw 2 different quadrilaterals on the geoboard below.

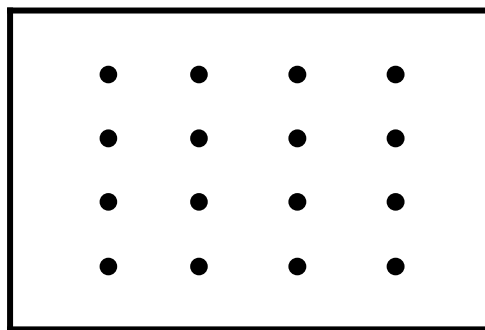


Shapes may share pegs but sides should not cross.



PS

1b. Draw 2 different quadrilaterals on the geoboard below.



Shapes may share pegs but sides should not cross.



PS

2a. True or false?



All quadrilaterals can be split into 2 equal triangles

Explain your answer.



R

2b. True or false?



The inner angles of a quadrilateral amount to 270°

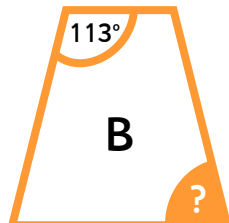
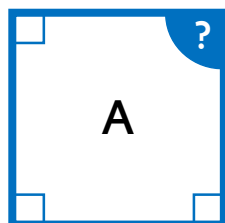
Explain your answer.



R

3a. Find the shape being described.

The opposite angles of the shape are equal and have a sum of 180° . If split into triangles they will always be right angled triangles.



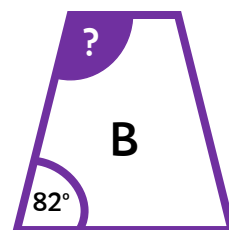
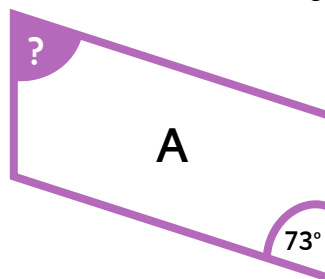
Calculate the angles marked ?.



PS

3b. Find the shape being described.

The missing angles are all larger than those given.



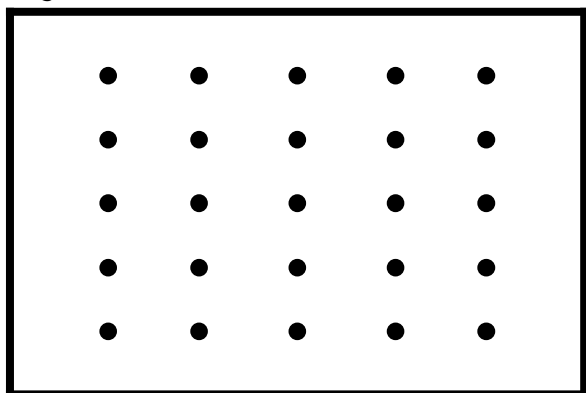
Calculate the angles marked ?.



PS

Reasoning and Problem Solving – Angles in Quadrilaterals

4a. Draw 3 different quadrilaterals on the geoboard below.

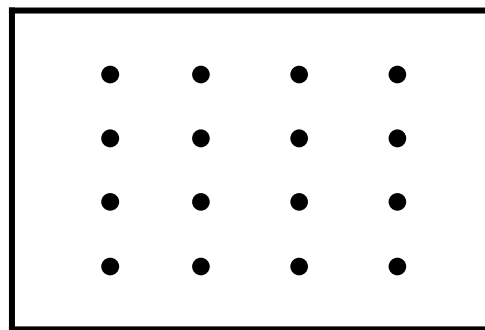


Shapes may share pegs but sides should not cross.



PS

4b. Draw 3 different quadrilaterals on the geoboard below.



Shapes may share pegs but sides should not cross.



PS

5a. True or false?



Parallelograms have equal sides.

Explain your answer.



R

5b. True or false?



Opposite angles in a rhombus are equal

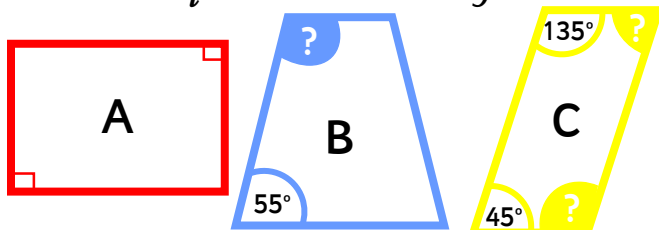
Explain your answer.



R

6a. Find the shape being described.

The missing angles of this shape will equal 305° . The shape can be split into 3 equal isosceles triangles.



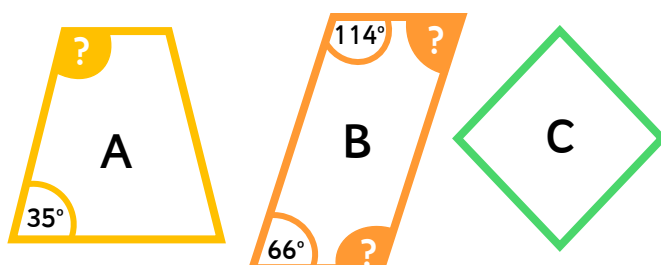
Calculate the angles marked ? .



PS

6b. Find the shape being described.

The shape has two acute angles. Only two sides of the shape are parallel.



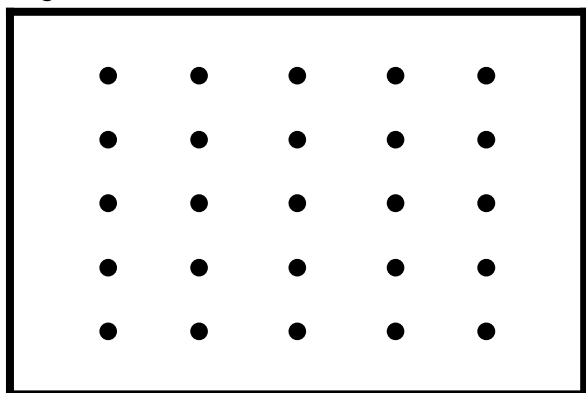
Calculate the angles marked ? .



PS

Reasoning and Problem Solving – Angles in Quadrilaterals

7a. Draw 4 different quadrilaterals on the geoboard below.

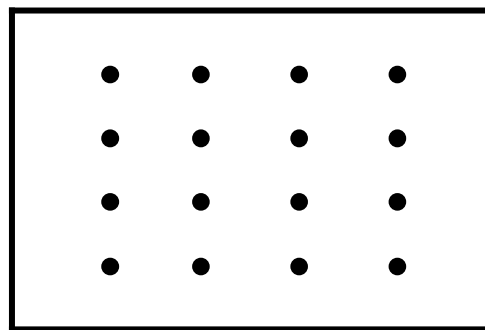


Shapes may share pegs but sides should not cross.



PS

7b. Draw 4 different quadrilaterals on the geoboard below.



Shapes may share pegs but sides should not cross.



PS

8a. True or false?



A square is also a rectangle

Explain your answer.



R

8b. True or false?



Any 2 triangles when joined together will make a parallelogram

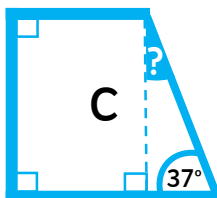
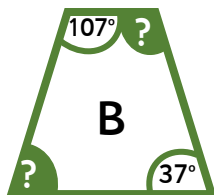
Explain your answer.



R

9a. Find the shape being described.

Identify shape with the most lines of symmetry.



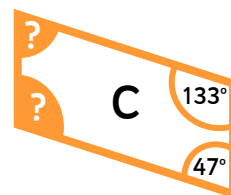
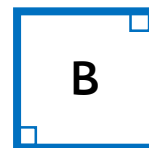
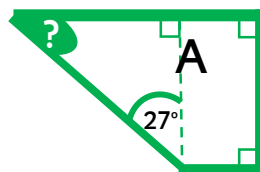
Calculate the angles marked ?.



PS

9b. Find the shape being described.

The shape is can be split into 4 equal triangles.



Calculate the angles marked ?.

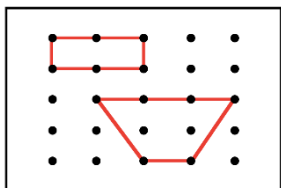


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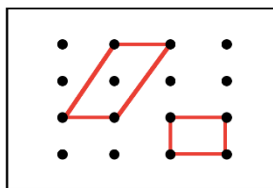
Reasoning and Problem Solving – Angles in Quadrilaterals

Developing

1a. Example answer:



1b. Example answer:



2a. False, trapezium would split into three triangles. Squares, parallelograms and rectangles can be split into 2 triangles

2b. False, the inner angles of a quadrilateral have a sum of 360°

3a. Shape A Square is being described.

3b. Shape B Trapezium is being described.

Missing angles:

Square A: 90°

Trapezium B: 67°

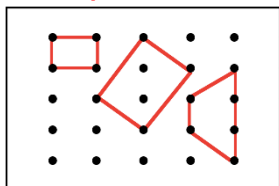
Missing angles:

Parallelogram A: 107°

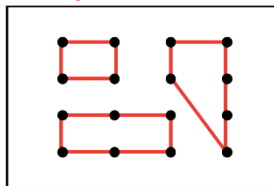
Trapezium B: 98°

Expected

4a. Example answer:



4b. Example answer:



5a. False, not all parallelograms have equal sides.

5b. True, opposite angles in a rhombus are equal.

6a. Shape B Trapezium is being described.

6b. Shape A Trapezium is being described.

Missing angles:

Trapezium B: 125°

Parallelogram C: top 45° bottom 135°

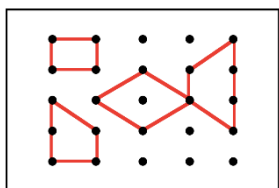
Missing angles:

Trapezium A: 145°

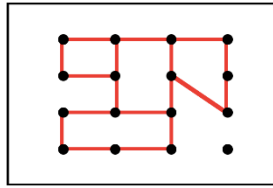
Parallelogram B: top 66° bottom 114°

Greater Depth

7a. Example answer:



7b. Example answer:



8a. True, a rectangle is defined as a quadrilateral with 4 angles of 90° . A square is a special kind of rectangle which has equal sides. Not all rectangles are squares.

8b. False, the triangles would have to have at least one side which is equal to one side of the other triangle in order to create a parallelogram.

9a. Shape A Rectangle is being described.

9b. Shape B Square is being described.

Missing angle

Trapezium B: top 143° bottom 73°

Trapezium C: 53°

Missing angle

Trapezium A: 63°

Parallelogram C: top 47° bottom 133°