## Higher Check In - 8.01 Conventions, notation and terms

1. ABCD is a polygon which has no parallel sides and one pair of equal angles. What is the name of this polygon?

2. Write down the name of any polyhedrons which have the same number of faces and vertices.

3. How many more edges does a pentagonal prism have than a cone?

4. Three points A (3, 5), B (8, 5) and C (6, ⁻1) form three of the vertices of a parallelogram. Find the coordinates of the fourth point D.

5. Place the following quadrilaterals in the correct position in the Venn diagram below.

   rectangle   kite   rhombus   parallelogram   trapezium
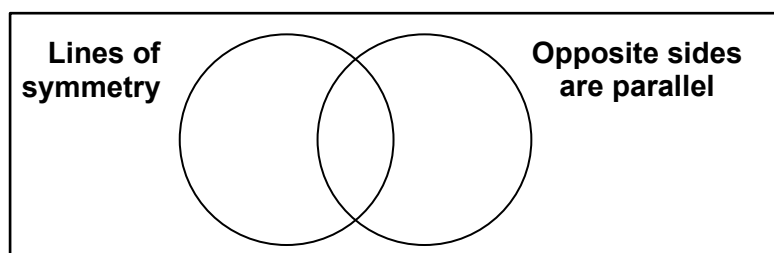
6. ABC is a triangle with lengths AB = 9 cm and AC = 9 cm. One of the angles is 100°. How many different triangles can be drawn with this information? Explain your answer.

7. A cone is sliced into two equal pieces along the vertical plane through the vertex. Each piece will have two flat faces. What are the shapes of these faces?

8. Triangle ABC with A (2, 5), B (1, 8) and C (4, 9) is reflected in the line $y = 2x + 1$ to form a quadrilateral. Find the coordinates of the fourth vertex, and name the quadrilateral.

9. Sally is designing a patchwork quilt using only regular polygons. She has decided on a floral pattern using one polygon for the centre of the flower and a different polygon for the petals surrounding the flower. If she uses regular pentagons for the petals, how many petals will be needed for each flower?

10. A rectangular table top has a perimeter of 10 m and an area of 5.8 m². Work out whether a tablecloth measuring 2.4 m by 2.6 m would cover this table top.

Extension

A tesseract is an "impossible" 4 dimensional cube. By considering the number of vertices of a point in zero dimensions, a line in one dimension, a square in two dimensions and a cube in three dimensions, can you describe the number of vertices in a tesseract?

Answers

1. Kite

2. Any pyramid e.g. triangular-based pyramid, square-based pyramid, pentagonal-based pyramid, hexagonal-based pyramid.

3. 14

4. (1, ⁻1)

5.
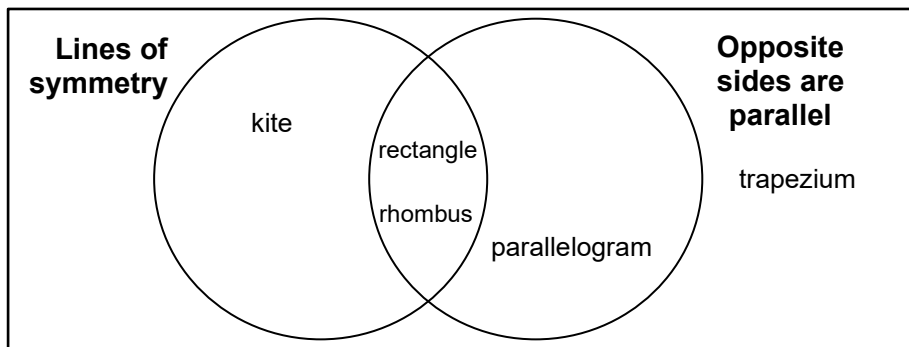
6. One, because 2 angles in an isosceles triangle are the same and if these were both 100° the sum of the angles in the triangle would be more than 180°.

7. An isosceles triangle and a semicircle.

8. (5, 6), square

9. 10 petals

10. Table top is 1.83 m by 3.17 m so the tablecloth fits the width but not the length.

Extension

16 vertices
Information and images can be found at https://en.wikipedia.org/wiki/Tesseract

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AO1	1	Identify a 2D shape from its properties			
AO1	2	Identify a 3D shape from its faces and vertices			
AO1	3	Know the properties of 3D shapes			
AO1	4	Use x and y coordinates in a plane geometry problem			
AO1	5	Know the properties of quadrilaterals			
AO2	6	Know the properties of an isosceles triangle			
AO2	7	Know the properties of 3D shapes			
AO2	8	Use x and y coordinates in a plane geometry problem			
AO3	9	Solve a problem involving regular polygons			
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