

# Regular and irregular polygons

Know that regular polygons have equal sides and equal angles



Challenge 1

- For each shape below, measure the length of all the sides to the nearest millimetre.
- Measure the size of all of the angles.
- Copy and complete the table below. Use ✓ for yes and ✗ for no.

**You will need:**  
 • ruler  
 • protractor

**A**

square

**B**

octagon

**C**

hexagon

**D**

triangle

**E**

pentagon

**F**

rhombus

Shape	A	B	C	D	E	F
Has all sides equal	✓					
Has all angles equal	✓					
Is a regular shape	✓					

Challenge 2

**A**

**B**

**C**

**D**

**E**

**F**

**G**

**H**

**I**

**J**

- The equal sides and equal angles are marked in each of the shapes. Copy and complete the table. Use ✓ for yes and ✗ for no.

Shape	A	B	C	D	E	F	G	H	I	J
All sides equal	✓									
All angles equal	✗									

- Look at the columns in the above table that show one or more ✗ responses. Write a sentence to say why the shape for that column cannot be a regular polygon.

**Example**  
 In shape A all the sides are equal but all the angles are not equal. Shape A is an irregular polygon.

Challenge 3

Using Resource 48: Regular polygons or the Geometry set tool, investigate how many diagonals you can draw, without any intersections, in a regular polygon with three to eight sides.

**You will need:**  
 • Resource 48: Regular polygons or  
 • Geometry set tool

Make a table of your results. Look for a pattern and use it to predict the number of pairs of non-intersecting diagonals there will be in a nine-sided regular polygon.

