SHARP

Worksheet 10: Construction of Geometric Figures

Grade 9 Mathematics

For this worksheet, you will need a compass, ruler and protractor.

1. Using your protractor draw the following:

   a) an angle of 30° b) an angle of 45°

   c) an angle of 60° d) an angle of 90°

2. Now, without a protractor and using your compass and ruler, draw the following angles:

   a) an angle of 30° b) an angle of 45°

   c) an angle of 60° d) an angle of 90°

3. Construct a triangle, ABC, with the base (AB) of the triangle 6cm, and the sides, AC and BC equal to 4cm.

   a) Measure each of the angles in ΔABC.

      i) What do you notice?

      ii) What rule can you make using the information you have gathered?

   b) Extend the line AB by another 3cm, to D.

      i) Measure $D\hat{B}C$.

      ii) What do you notice?

      iii) What rule can you make using the information you have?

4. Construct two triangles:

   ΔDEF – DE = 3cm, EF = 4cm and DF = 5cm.

   ΔGHJ – HJ = 4cm, $H\hat{J}G = 90°$*, and GJ = 3cm.*

   a) What do you notice about these two triangles?

   b) In what other ways could you construct these triangles so that they are the same?

5. Construct a rectangle, the long sides should be 5cm and the short sides should be 3cm.

   a) Measure the length of the diagonals.

      i) What do you notice?

      ii) What can we say about diagonals in rectangles?

      iii) Name and draw other quadrilaterals where this property also occurs.

   b) Measure the angles that the diagonals make.

      i) What do you notice?

      ii) What can we say about the angles diagonals in rectangles make?

      iii) Name and draw other quadrilaterals where this property also occurs.

      iv) How are the angles of a diagonal in a square different to the angles of diagonals in a rectangle?

6. Construct a square with sides 3cm, a regular pentagon with sides 3cm and a regular hexagon with sides 3cm.

   a) Measure the interior angles of the square, pentagon and hexagon.

   b) What is the sum of the interior angles of the square, pentagon and hexagon?

   c) What do you notice about this sum?