

# ESSENTIAL MATHEMATICS 3

## WEEK 6 NOTES AND EXERCISES

### Two-Dimensional Shapes

Shapes surround us every day. The most common shapes are triangles and quadrilaterals. Triangles and quadrilaterals are examples of two-dimensional shapes.

#### Exercise Set 1

Q1. Use the word list to complete the following paragraphs. You can use words more than once.



The three sides on this surface of the pyramid are equal.

angle

angles

equilateral

scalene

sides

two

90°

acute

We name triangles according to the lengths of their \_\_\_\_\_. A triangle with three sides the same length is called an \_\_\_\_\_ triangle. This triangle also has three \_\_\_\_\_ equal. Each \_\_\_\_\_ is equal to 60°. An isosceles triangle has \_\_\_\_\_ sides and \_\_\_\_\_ angles equal. A \_\_\_\_\_ triangle has no sides the same length. A triangle with three angles less than 90° is called an \_\_\_\_\_ - angled triangle. A right-angled triangle has one angle of \_\_\_\_\_.

Q2. The rectangle and square.



bisect      diagonal      equal      parallelogram      rhombus      90°

A rectangle has all the features of a \_\_\_\_\_ . However, in a rectangle all the angles are \_\_\_\_\_

And the diagonals are \_\_\_\_\_ lengths.

A square has all the features of a \_\_\_\_\_ . In addition, the sides are all \_\_\_\_\_ . The

angles are all \_\_\_\_\_ . The \_\_\_\_\_ are the same length.

Q3. More polygons.



decagon

hexagon

number

octagon

Pentagon

quadrilateral

regular

A ploygon is a shape with straight sides. We use the \_\_\_\_\_ of sides to name each polygon. We

have just looked at triangles and \_\_\_\_\_ . The following names are applied to ploygons

with more than 4 sides.

Name	Number of sides
	5
	6
Heptagon	7
	8
Nonagon	9
	10
Undecagon	11
Dodecagon	12

When all the sides of a ploygon are equal, it is called a \_\_\_\_\_ ploygon. The equilateral triangle

and square are \_\_\_\_\_ polygons.

## Constructing Regular Polygons.

### Exercise Set 2

Q1. The easiest regular polygon to construct is a hexagon.

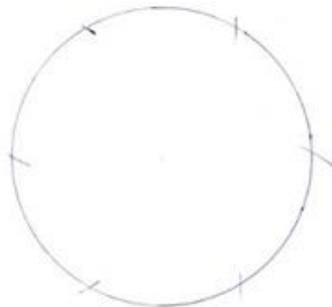


Figure 1

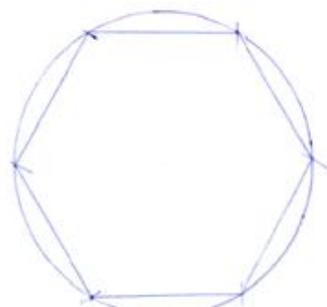


Figure 2

To construct a hexagon, use a compass to draw a circle. Now, (keeping the compass at the same exact setting), place the compass point on the circumference and strike an arc on the circumference. Next, place the compass *point* in the *arc* just drawn and strike another arc. Do this until you have drawn six arcs. (See Figure 1).

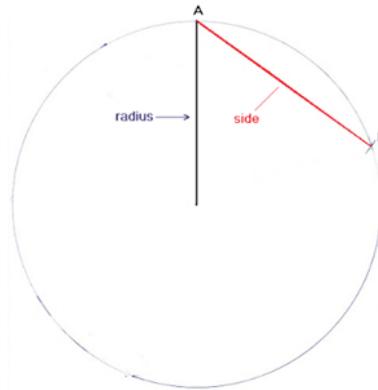
Now, get a ruler, and draw lines from one arc to the next. The 6 lines you just drew are the *sides* of the regular hexagon. (See Figure 2).

A hexagon is the *only* case in which a polygon's sides will exactly equal the radius.

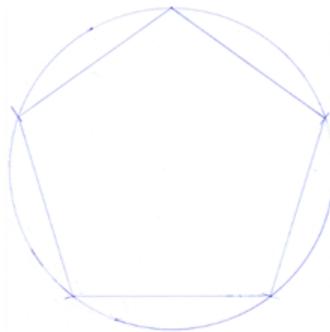
In the space below construct a regular hexagon.

## Q2. Constructing a pentagon

Start out by drawing a circle. For this exercise use a radius of 4 cm.



For a regular pentagon with radius of 4 cm, the length of each side can be calculated to be 4.7 cm. Now, precisely as you can, set the compass width to 4.7 cm. Place the compass point at point A and strike an arc at point B, then continuing from B strike another 4 arcs.



Use these instructions to construct a regular pentagon.