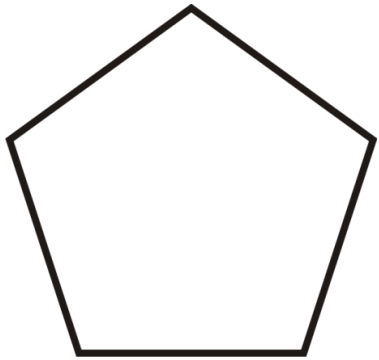
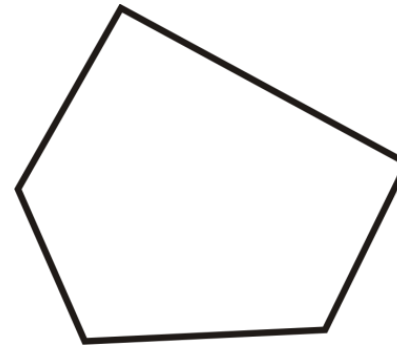
POLYGONS

A polygon is a plane rectilinear figure with more than 4 sides. Regular polygons have equal sides and angles.

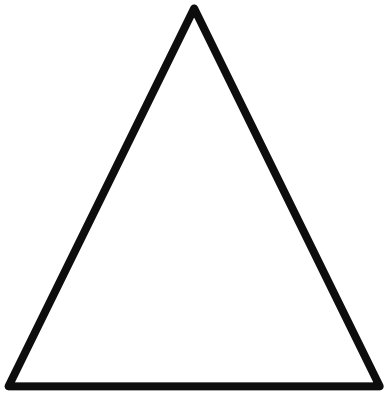
A pentagon has five (5) sides, a hexagon has six (6) sides, a heptagon has seven (7) sides, an octagon has eight (8) sides, a nonagon has nine (9) sides and decagon has ten (10) sides.



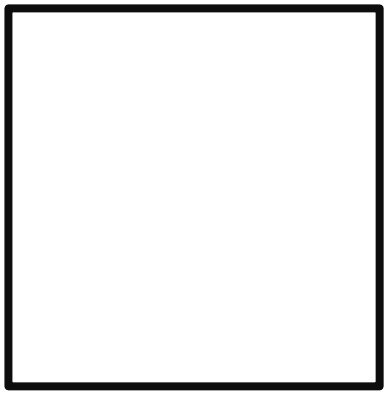
Regular Pentagon
(e.g. Regular Polygon)



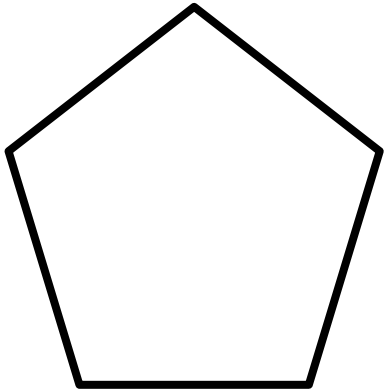
Irregular Pentagon
(e.g. Irregular Polygon)



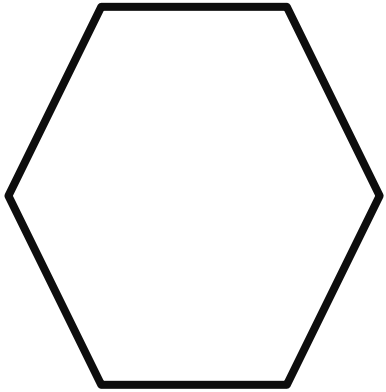
Triangle



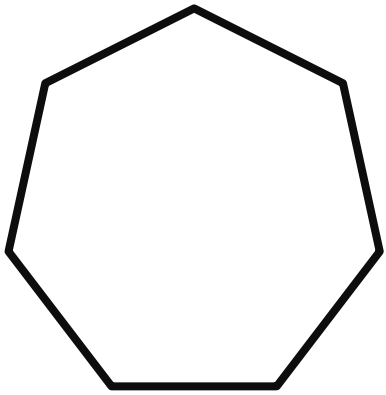
Quadrilateral



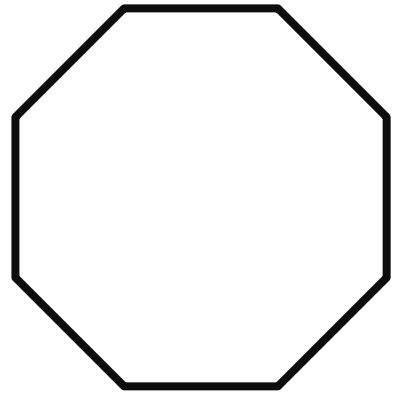
Pentagon



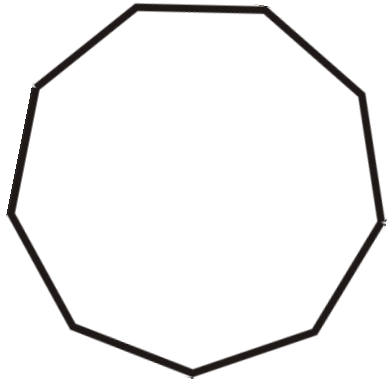
Hexagon



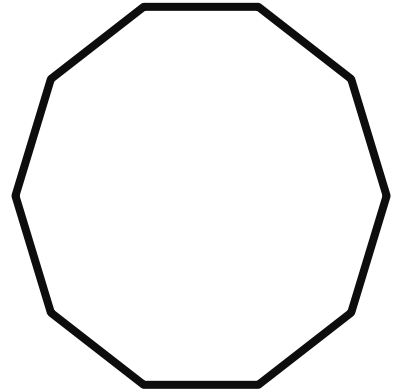
Heptagon



Octagon



Nonagon

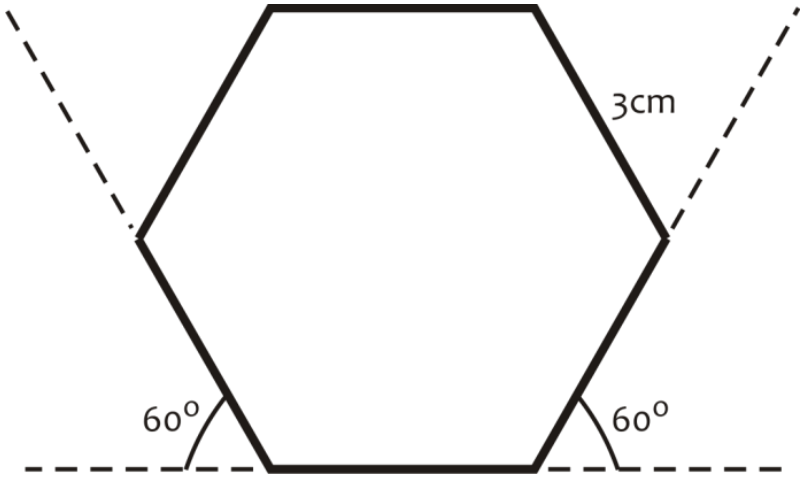


Decagon

To Draw a Hexagon using a 60° Set Square when given the Length of Side

1. Draw one side AB
2. Draw a line from A and B in turn at 60° and mark off the length of side to give points C and D.
3. Draw a line from C and D in turns at 60° and mark off the length of side to give points E and F.
4. Join E and F.

For example: draw a regular hexagon with side 3cm.



A regular hexagon of side 3cm

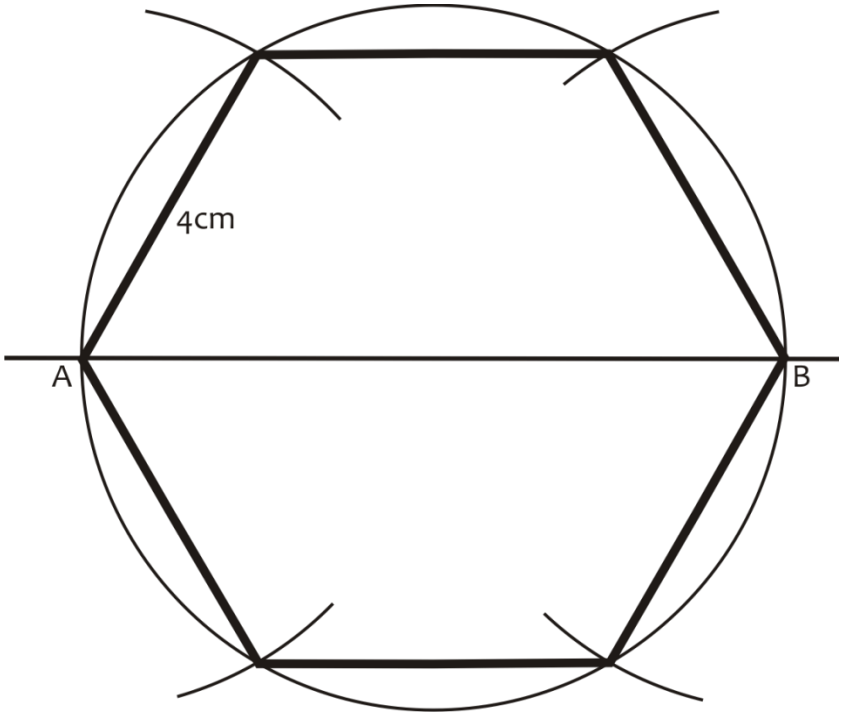
To Draw a Hexagon within a Circle when Given the Length of Side

1. Draw a circle of radius equal to the length of the given side.
2. Draw horizontal diameter AB. With centres A and B in turn and radius of the circle draw arcs

above and below AB to cut the circumference at C, D, E, and F.

3. Join all the points to complete the hexagon.

For example: Construct a hexagon of side 4cm.

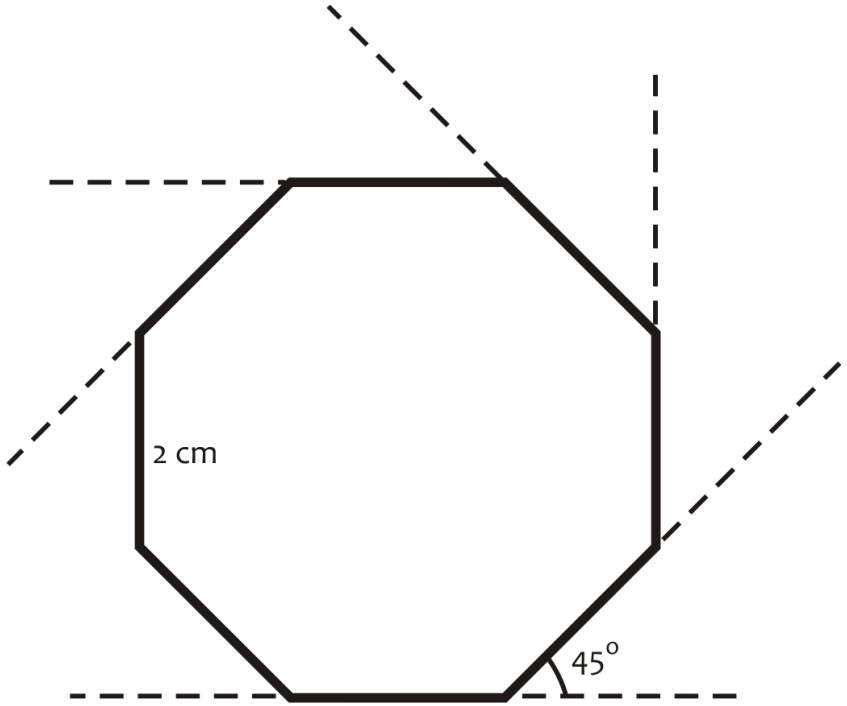


A hexagon of side 4cm constructed in a circle

To Draw an Octagon using a 45° Set Square

1. Draw one side AB.
2. Draw a line from A and B in turn at 45° and mark off the length of side to give points C and D.
3. Draw a line from C and D in turn perpendicular to AB and mark off the length of side to give points E and F.
4. Draw a line from E and F in turn at 45° and mark off the length of side to give points G and H.
5. Join G and H.

For example: Draw an octagon of side 2cm.



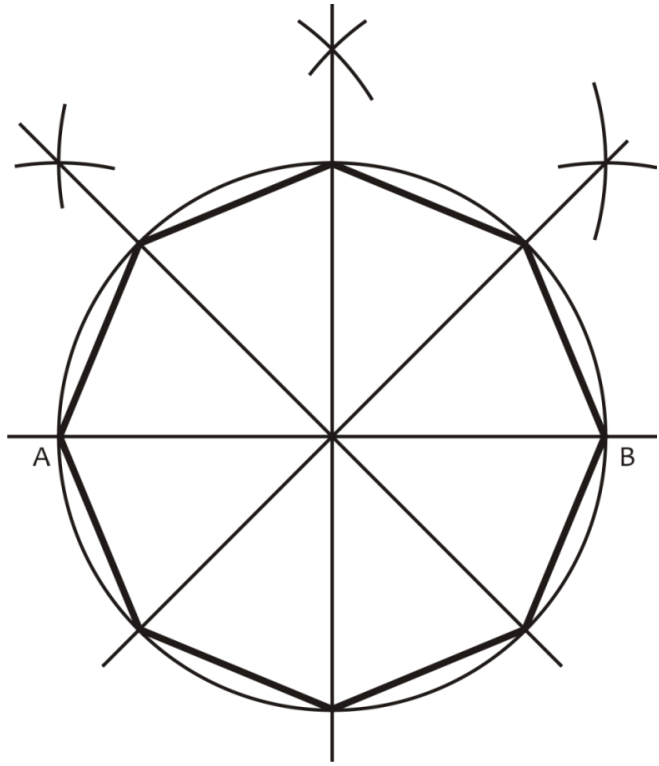
An octagon of side 2cm

To Draw an Octagon within a Given Circle

1. Draw the given circle with diameters AB and CD at right angles.

2. Bisect each of the 90^{o} angles to give points 1, 2, 3, and 4 on the circumference.
3. Join all the points to complete the octagon.

For example: Draw an octagon in a circle with radius 3cm

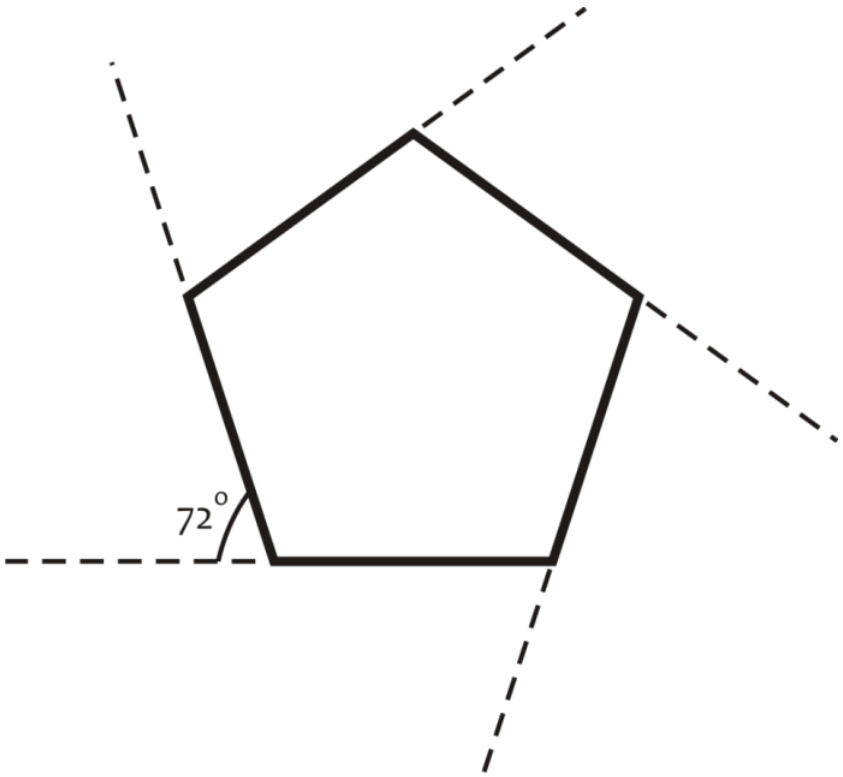


An octagon in a circle of radius 3cm

To Draw any Regular Polygon with the aid of a Protractor when Given the Length of Side

1. Divide 360^o by the number of sides of the polygon to obtain the external angle. For instance, a pentagon has external angle $= \frac{360}{5} = 72^o$.
2. Draw one side AB and draw a construction line at 72^o to AB from A and B. Mark the length of sides C and D on these lines and draw lines at 72^o to the sides BC and AD from C and D to intersect at E.
3. ABCDE is the required pentagon.

For example: Draw a pentagon with side 3cm.



A pentagon of side 3cm.

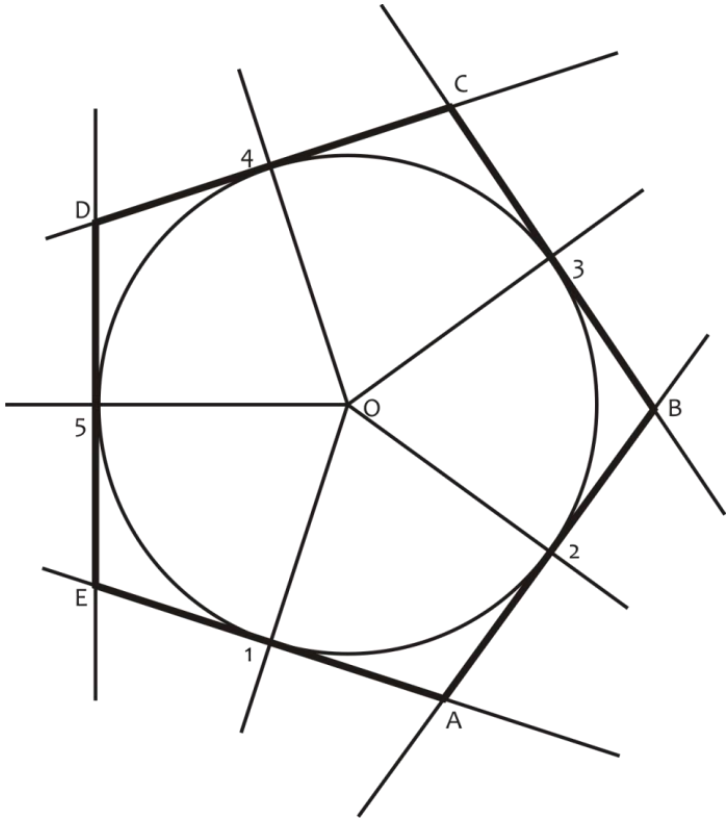
To Circumscribe a Circle with any Regular Polygon

1. Divide 360^{o} by the number of sides (n) of the polygon to obtain the internal sector angles of

the circle. For example, a pentagon has 5 sides thus each sector angle of the circle = $\frac{360}{5} = 72^o$.

2. Draw the circle with centre O. Draw a radius O1 and then construct five angles of 72^o at the centre O (angles 1O2, 2O3, 3O4, etc.)
3. Draw AB to touch the circumference at 1 and perpendicular to O1, etc.
4. ABCDE is the required circumscribing pentagon.

Example: Circumscribe a circle of 3cm radius with a pentagon.



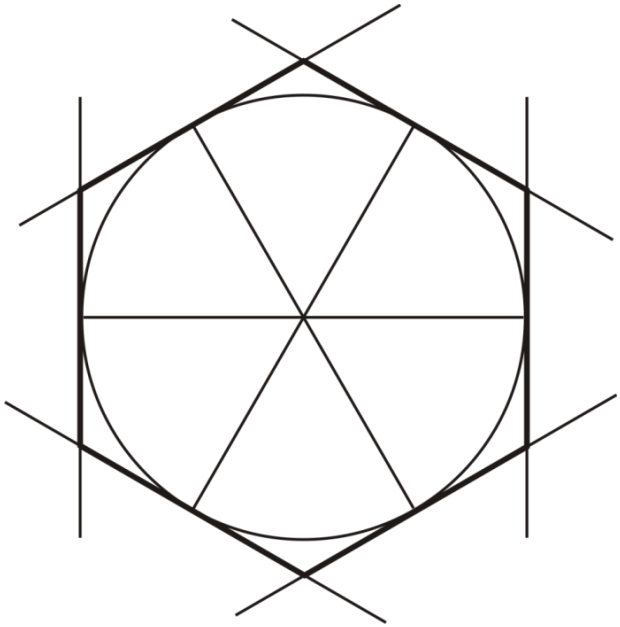
Pentagon circumscribing a circle of radius 3cm

To Draw a Hexagon when Given the Distance across the Flats

1. Draw a circle equal in diameter to the distance across the flats.

2. Draw an extended vertical diameter.
3. Draw the four sides as shown with the set square to touch the circumference of the circle.
4. Draw the remaining two sides vertical and touching the circumference of the circle.

For example: draw hexagon with 6cm distance across its flaps.

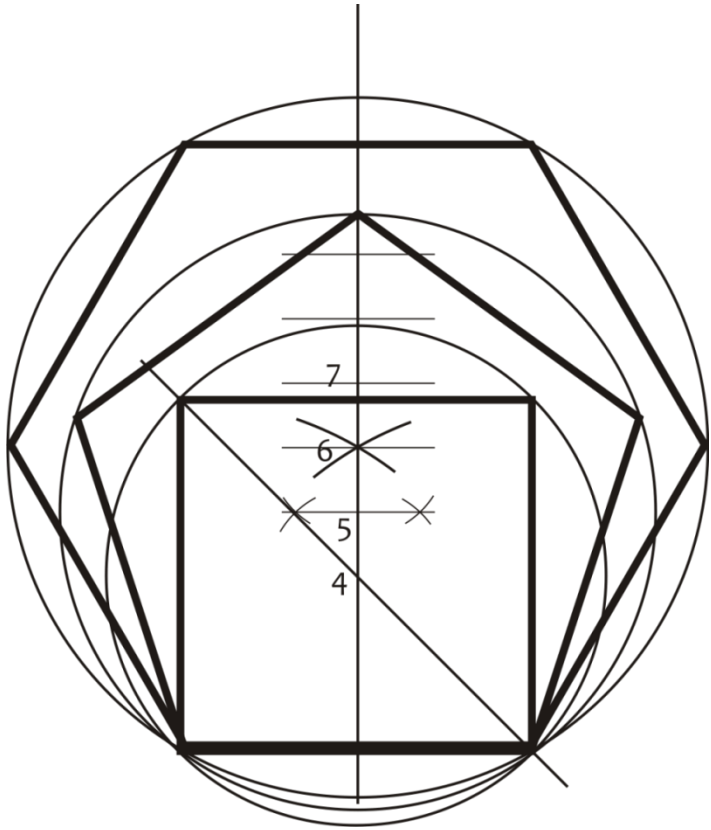


A hexagon with 6cm distance across its flaps.

To Draw a Square and Polygons on a Given Base

1. Draw the given base AB and bisect it.
2. Construct a square on AB.
3. Draw a diagonal on the square to cut the bisector of AB at 4.
4. With centres A and B in turn and radius AB draw arcs to intersect at 6.
5. Bisect 4-6 to obtain 5.
6. Take unit 4-5 and step it off to obtain points 7, 8, 9, etc.
7. To draw a pentagon, use 5 as centre and radius 5B (or 5A) and draw a circle.
8. Take the base AB and step it off on the circle to obtain the other four sides.

9. Proceed in a similar manner to draw the other polygons with 6, 7, 8, etc. as circle centres and radius 6B, 7B, 8B, etc. respectively.



Polygons drawn on the same base AB