

Architecture



LESSON # 40 ~ Constructing Regular Polygons

A regular polygon is **equilateral** and **equiangular**. This means all **sides** and all **angles** are **congruent**.

In order to construct:

1. Divide the circle (360°) into the number of sides corresponding to the polygon.



$$\frac{360}{3} = 120^\circ \text{ Central Angle}$$

To find the angles of a regular polygon, you need to know the following...

Triangle



$$180^\circ$$

$$\frac{180}{3} = 60^\circ$$

Interior Angles

a circle \times

Pentagon



$$(n-2)180^\circ$$

$$(5-2)180 = 540^\circ$$

$$\text{Interior Angle} = \frac{540}{5}$$

$$= 108^\circ$$

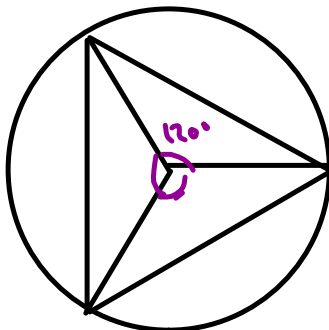
Central Angle

$$\frac{360}{5} = \underline{\underline{72^\circ}}$$

2. Draw a radius to get started.
3. Take your protractor to draw the central angles all the way around.
4. Draw your chords.

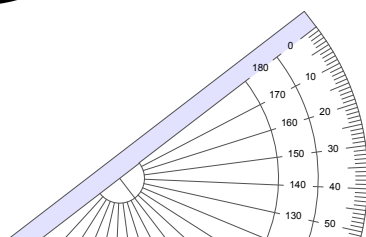
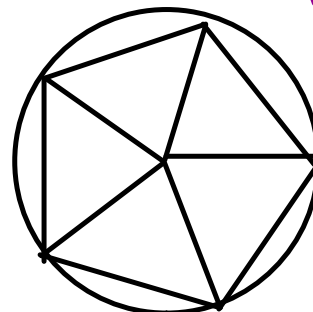
Triangle

$$120^\circ$$



Pentagon

$$72^\circ$$



Homework

Act Booklet:

P 75 #3-6

WORKSHEET

230

L.40.



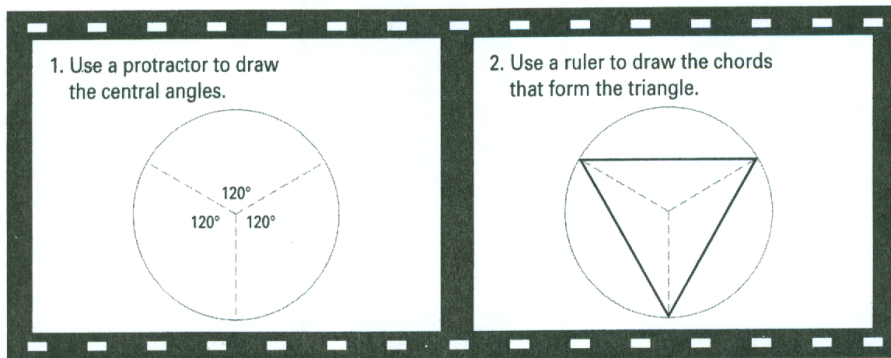
Constructing Regular Polygons

A regular polygon is equilateral and equiangular. These two properties mean that a regular polygon can be inscribed in a circle. Therefore, a circle is used to help construct it.

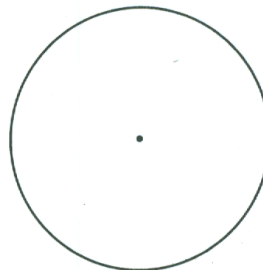
ACTIVITY: *Bits of Film!*

a) The film frames below show how to construct an equilateral triangle. Study the frames and then construct the given polygons.

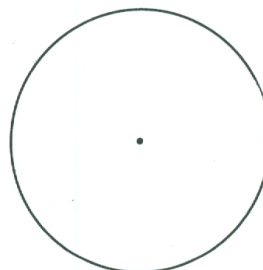
- Equilateral triangle:** To construct an equilateral triangle, divide the circle into three congruent arcs subtended by three congruent central angles of 120° each. Then draw the chords to form the triangle.



- Square:** To construct a square, divide the circle into congruent arcs subtended by congruent central angles of . Then draw the chords to form the square.



- Regular pentagon:** To construct a regular pentagon, divide the circle into congruent arcs subtended by congruent central angles of . Then draw the chords to form the pentagon.

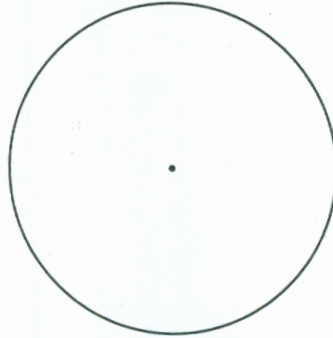


WORKSHEET

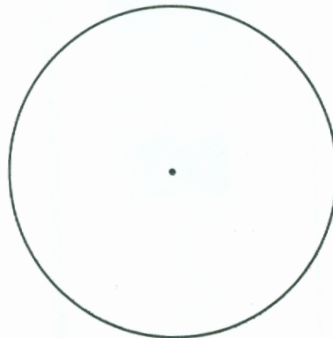
29

Lesson
40

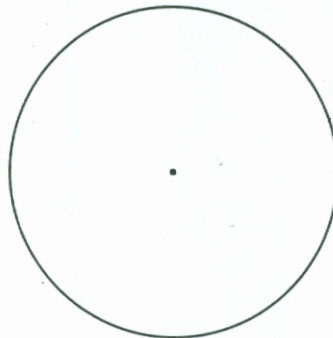
4. **Regular hexagon:** To construct a regular hexagon, divide the circle into congruent arcs subtended by congruent central angles of . Then, ...



5. **Regular octagon:** To construct a regular octagon, divide the circle into congruent arcs subtended by congruent central angles of . Then, ...

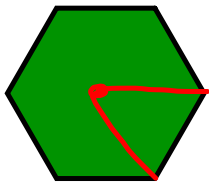


6. **Regular decagon:** To construct a regular decagon, divide the circle into congruent arcs subtended by congruent central angles of . Then, ...

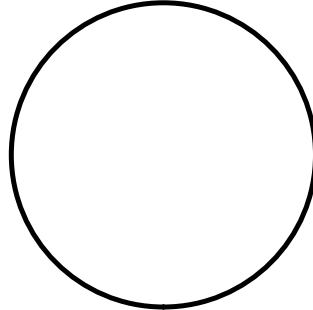


L. 40: Constructing Polygons

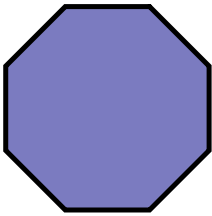
a) hexagon



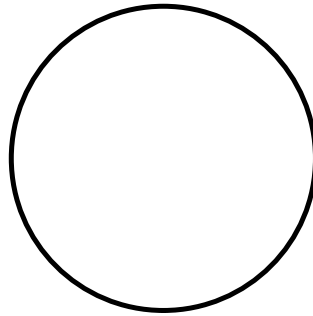
$$\frac{360}{6} = 60^\circ$$



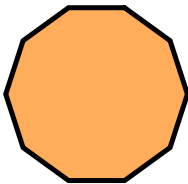
b) octagon



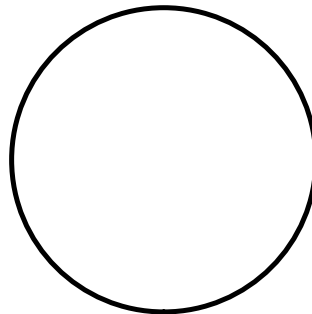
$$\frac{360}{8} = 45^\circ$$



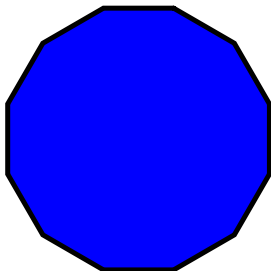
c) decagon



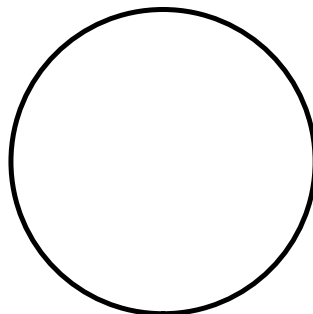
$$\frac{360}{10} = 36^\circ$$



d) dodecagon



$$\frac{360}{12} = 30^\circ$$



Attachments

architecture.asf