ANGLES
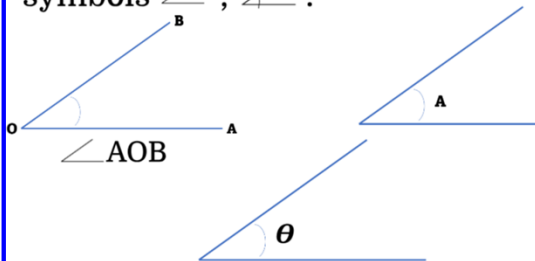
ANGLE

It is the figure generated by the rotation of a half-line around its end point, from an initial position to a terminal position; the amplitude of the rotation is the measure of the angle.
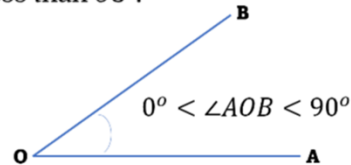
B

Terminal side

O

Initial side

A
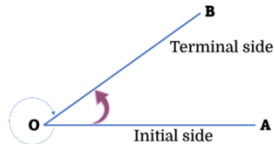
ANGLE NOTATION

Angles are represented by capital letters, Greek letters, or the symbols $\angle$, $\measuredangle$.

B

O

A

$\angle$ AOB

A

θ

ANGLES ACCORDING TO ITS MEASURE

ACUTE ANGLE: is one that measures more than 0° and less than 90°.

B

$$0^o < \angle AOB < 90^o$$

O

A

RIGHT ANGLE: is one that measures 90°.

B

$$\angle AOB = 90^o$$

O

A
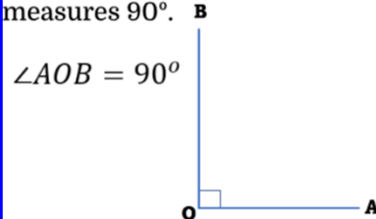
OBTUSE ANGLE: is one that measures more than 90° and less than 180°.

B

$$90^o < \angle AOB < 180^o$$

O

A
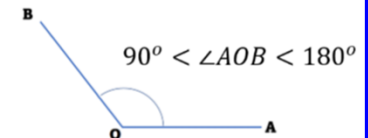
STRAIGHT ANGLE: is the one that measures 180°.

$$\angle AOB = 180^o$$

B

O

A
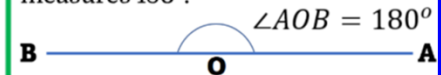
FULL OR COTERMINAL ANGLE: is the one that measures 360° and its sides coincide.

$$\angle AOB = 360^o$$

O

B

A

ANGLES

ANGLES ACCORDING TO THEIR SUM

COMPLEMENTARY ANGLES: are those in which their measures add to 90°.

$$\angle AOB + \angle BOC = 90^o$$
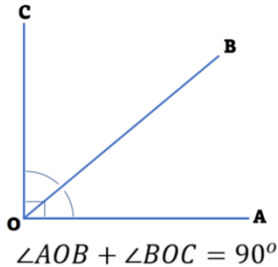
SUPPLEMENTARY ANGLES: are those in which their measures add to 180°.

$$\angle AOB + \angle BOC + \angle COD = 180^o$$

ANGLES BETWEEN PARALLEL LINES
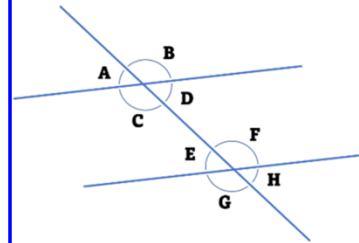
ALTERNATE INTERIOR ANGLES: are those that are formed with the oblique line within the parallels and have the same magnitude.

ALTERNATE EXTERIOR ANGLES: are those that are formed with the oblique line outside the parallels and have the same magnitude.

CORRESPONDING ANGLES: are those formed by the oblique line with each of the parallel lines, are on the same side, and have the same magnitude.

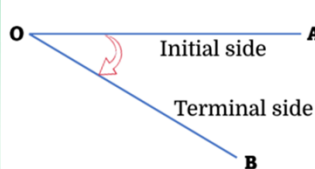| Alternate Interior:	Alternate Exterior:	Corresponding:
C=F	A=H	A=E
D=E	B=G	B=F
		C=G
		D=H

ANGLES ACCORDING TO THEIR SENSE

An angle is positive if the rotation of the terminal side is in a counterclockwise sense.

Terminal side

Initial side

An angle is negative if the rotation of the terminal side is in a clockwise sense.

Initial side

Terminal side

ANGLES

ADJACENT ANGLES: are two angles that have the same vertex and a side in common.

OPPOSITE ANGLES: are those that have the vertex in common and the sides of one are the prolongation of the other.

A is adjacent to C but not necessarily equal.
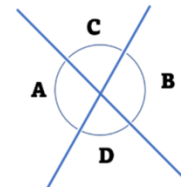
A is opposite with B and they are equal.

ANGLES

The unit of measurement for angles may be degrees, radians, or mils.

EXAMPLE: Transform 2π radians to degrees.

SOLUTION: 1) Using:

$\pi \text{ rad} = 180^o$

$2\pi \text{ rad} \Rightarrow x$

2) Solving:

$x = \dfrac{(2\pi \text{ rad})(180^o)}{\pi \text{ rad}}$

$x = \dfrac{(2\pi \text{ rad})(180^o)}{\pi \text{ rad}}$

$x = \dfrac{(2\pi)(180^o)}{\pi}$

$x = (2)(180^o)$

$x = 360^o$

Hence:

$2\pi \text{ rad} = 360^o$

EXAMPLE: Transform 35.41° to degrees, minutes, and seconds:

SOLUTION: 1) Transforming 0.41° to minutes:

$1^o \rightarrow 60'$

$0.41^o \Rightarrow x$

2) Solving:

$x = \dfrac{(0.41^o)(60')}{1^o}$

$x = (0.41)(60')$

$x = 24.6'$

Hence:

35.41° = 35° 24.6′

3) Transforming 0.6′ to seconds:

$1' \rightarrow 60''$

$0.6' \Rightarrow x$

4) Solving:

$x = \dfrac{(0.6')(60'')}{1'}$

$x = (0.6)(60'')$

$x = 36''$

Hence:

35.41° = 35° 24′ 36″