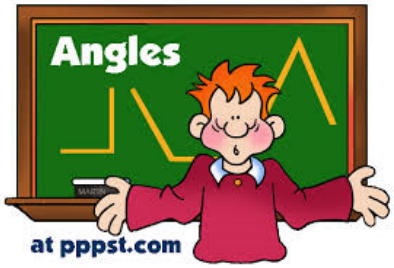
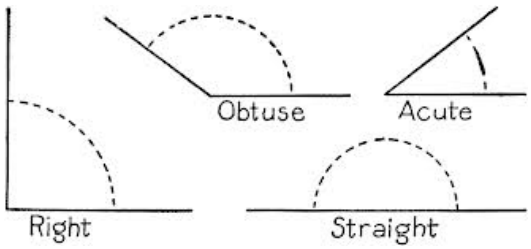
1.4 Measure and Classify Angles

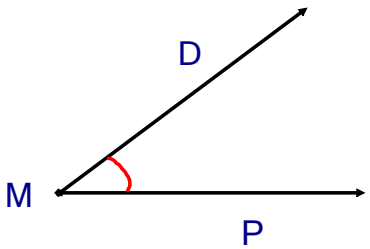
Goal: Name, measure, and classify angles.





Angle - union of two rays with the same endpoint

* the rays are the sides of the angle and the endpoint is the vertex of the angle



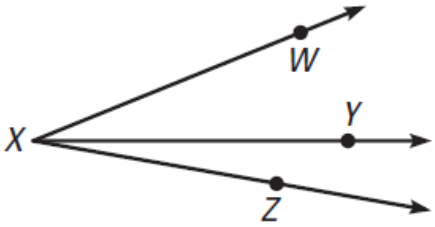
vertex: M

sides: $\overrightarrow{MD}$ $\overrightarrow{MP}$

name the angle: ∠DMP
∠PMD
∠M

∠PMD endpoint = M = vertex
∠DMP Sides = MP
∠M = MD

How many angles in the figure below? Name them.

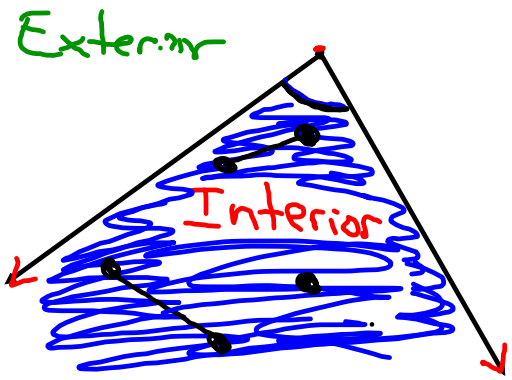


∠WXY
∠WXZ
∠YXZ

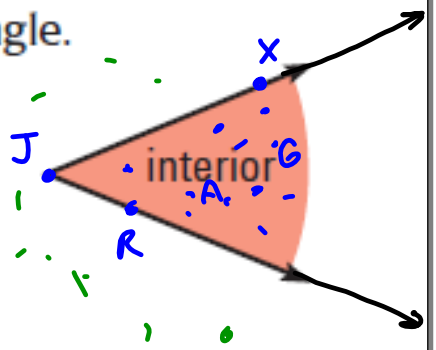
You should not name any of these angles $\angle X$ because all three angles have X as their vertex.

* the measure of an angle is the openness of the interior of an angle in degrees °

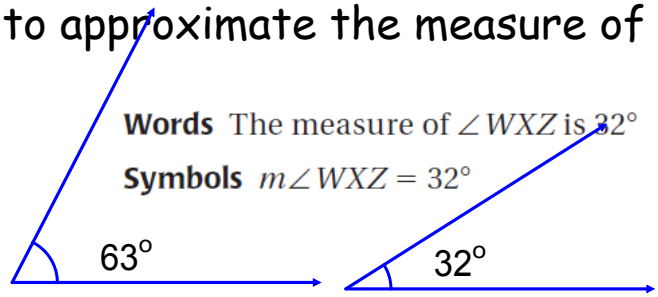
Interior / Exterior of an Angle

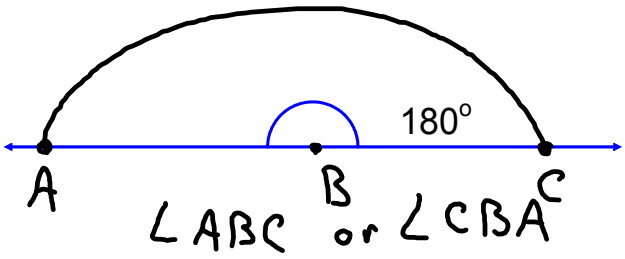


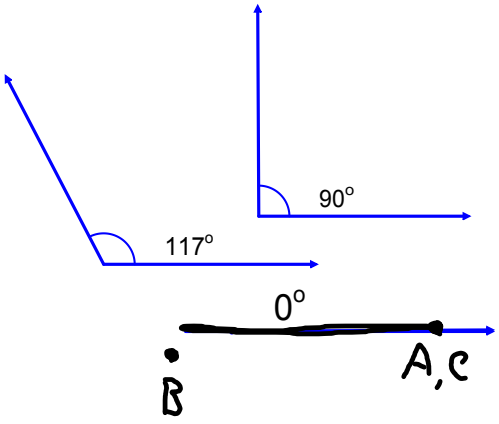
A point is in the *interior* of an angle if it is between points that lie on each side of the angle.



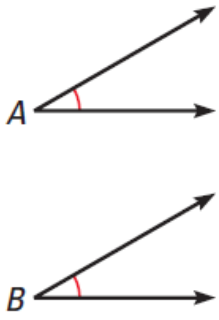
* a protractor can be used to approximate the measure of an angle







* Two angles are congruent angles if and only if they have the same measure.



Angle measures are equal.

$m\angle A = m\angle B$

"is equal to"

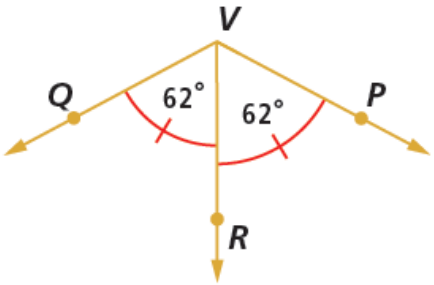
Angles are congruent.

$\angle A \cong \angle B$

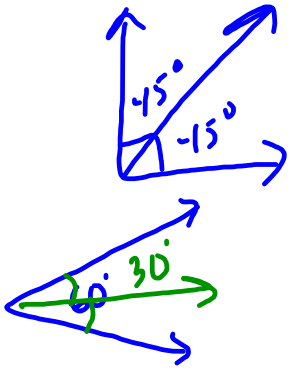
"is congruent to"

Angle Bisector - is a ray (line or segment) that divides an angle into two angles that are congruent

splits angle in half

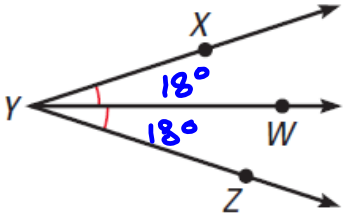


$\overrightarrow{VR}$ bisects $\angle PVQ$.



In the diagram at the right, $\overrightarrow{YW}$ bisects $\angle XYZ$, and $m\angle XYW = 18°$. Find $m\angle XYZ$.

36°



Types of Angles

zero = 0°

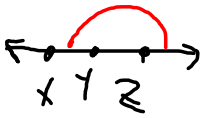
∠BAC

acute less than 90°

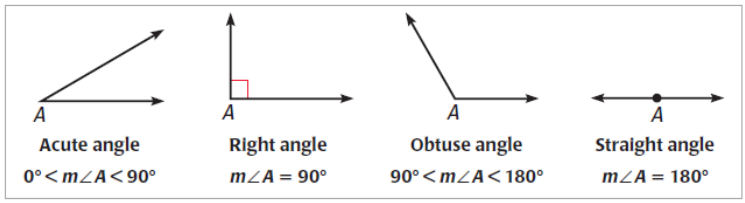
right = 90°

obtuse greater than 90°

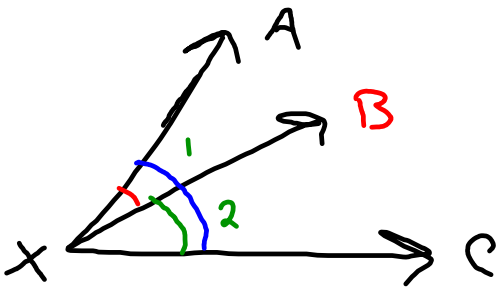
straight = 180°

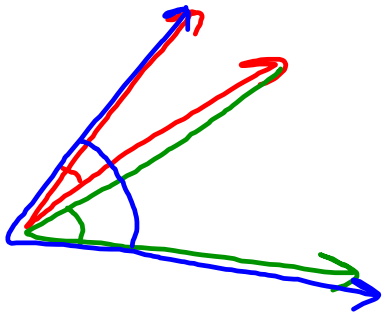


∠XYZ

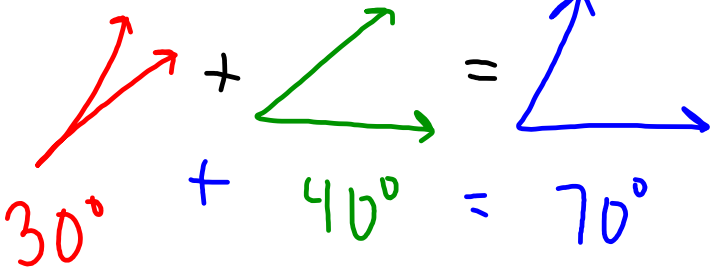


Angle Addition Postulate -





∠AXB + ∠BXC = ∠AXC



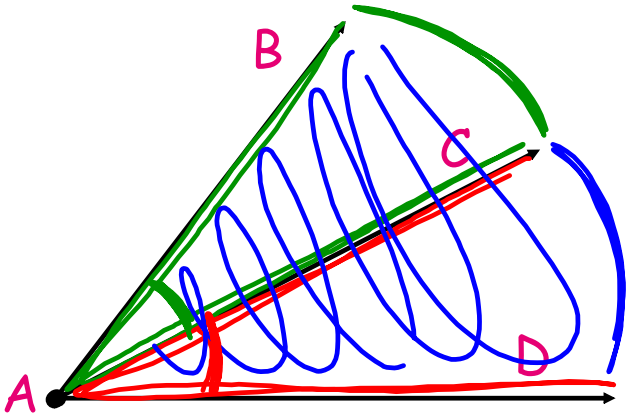
30° + 40° = 70°

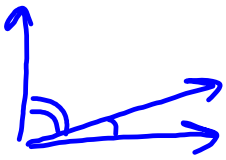
AB + BC = AC

adjacent angles - 2 angles that share a common vertex and side, but have no common interior points

$\angle BAD$

$\overrightarrow{AC}$



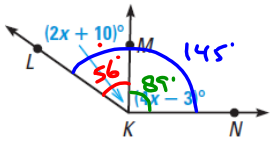


adjacent = next to

$\angle BAC$
$\angle CAD$

- are next to each other
- share a common side in the interior

Given that $m\angle LKN = 145°$, find $m\angle LKM$ and $m\angle MKN$.



$m\angle LKM + m\angle MKN = m\angle LKM$

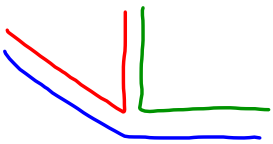
$2x+10 + 4x-3 = 145°$

$6x+7 = 145$

$-7 \quad -7$

$\frac{6x}{6} = \frac{138}{6}$

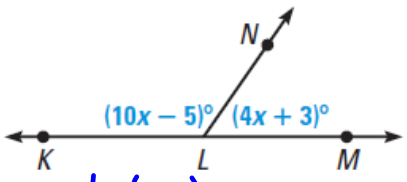
$x = 23$



$m\angle LKM = 2x+10$
$= 2(23)+10$
$= 46+10$
$= 56$

$m\angle MKN = 4x-3$
$= 4(23)-3$
$= 92-3$
$= 89°$

Given that $\angle KLM$ is a straight angle, find $m\angle KLN$ and $m\angle NLM$.



$4(13)+3=55$

$\angle NLM = 55$

$10(13)-5=125$

$\angle KLN = 125$

$10x-5+4x+3=180^\circ$

$14x+2=180$

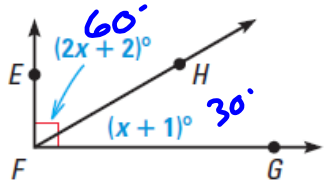
$+2 \quad +2$

$14x=182^\circ$

$\frac{14x}{14} = \frac{182^\circ}{14}$

$x=13$

Given that $\angle EFG$ is a right angle, find $m\angle EFH$ and $m\angle HFG$.



$\angle EFH = 2x+2$

$= 2(29)+2$

$= 58+2$

$= 60^\circ$

$\angle HFG = x+1$

$= 29+1$

$= 30^\circ$

$2x+2+x+1=90^\circ$

$3x+3=90^\circ$

$-3 \quad -3$

$\frac{3x}{3} = \frac{87}{3}$

$x=29$

HW: Pg 28 #'s 1-31, 33-42, 48, 51-54