

Lines and Angles



Goals: *Classify angles as acute, obtuse, or right *Use angle relationships to find missing angle measures

Acute angle: angle less than 90°

Obtuse angle: angle more than 90°

<u>Right angle</u>: angle equal to 90°

Classify the following types of angles:



Find missing angles:

Ex:



Ex: $\angle A$ and $\angle B$ are complementary. Find $\angle A$ if $\angle B = 61^{\circ}$. $90 - 61 = 29^{\circ}$



Ex: $\angle 1 = y^{\circ} \quad \angle 2 = 2y^{\circ}$ $\angle 1$ and $\angle 2$ are complementary. Find $\angle 1$ and $\angle 2$.

$$y + 2y = 90$$
$$\frac{3y}{3} = \frac{90}{3}$$
$$y = 30$$

Supplementary Angles: Angles whose sum is 180°

Are the two angles supplementary?



Ex: $\angle A$ and $\angle B$ are supplementary. $\angle A = 3x^{\circ}$ and $\angle B = 6x^{\circ}$. Find both angles.



Adjacent angles: Two angles that share a common ray

Ex: Name two adjacent angles.



 $\angle ABD$ is adjacent to $\angle DBC$



Ex: Name the vertex of the previous example. *B*

Vertical angles: Two angles located opposite each other, formed by intersecting lines. *Vertical angels are congruent!



Ex: Name two sets of vertical angles

 $\angle A$ and $\angle C$

 $\angle D$ and $\angle B$

Find the value of *x*.



Parallel lines: Lines that never intersect

Transversal: A line that intersects parallel lines.

When parallel lines are intersected by a <u>transversal</u>, <u>8</u> angles are formed.

There are ___4___ pairs. Each pair is _congruent__, meaning they have the same measure.



Vertical Angles: Two angles located opposite each other on intersecting lines

 $\angle 2$ and $\angle 3$ $\angle 5$ and $\angle 8$ $\angle 6$ and $\angle 7$ $\angle 1$ and $\angle 4$

Corresponding Angles: Two angles in the "same spot" on separate parallel lines. (Same room, different house)

 $\angle 8$ and $\angle 4$ $\angle 2$ and $\angle 6$ $\angle 1$ and $\angle 5$ $\angle 3$ and $\angle 7$



<u>Alternate Exterior Angles</u>: Two angles *outside* the parallel lines on *opposite* sides of the transversal that have the same measure

 $\angle 1$ and $\angle 8$ $\angle 2$ and $\angle 7$



<u>Alternate Interior Angles</u>: Two angles *inside* the parallel lines, on *opposite* sides of the transversal that have the same measure.

 $\angle 3$ and $\angle 6$ $\angle 4$ and $\angle 5$

Find the missing angle measures:



 $m \angle 2 = 60^{\circ}$ $m \angle 3 = 60^{\circ}$ $m \angle 4 = 120^{\circ}$ $m \angle 5 = 120^{\circ}$ $m \angle 6 = 60^{\circ}$ $m \angle 8 = 120^{\circ}$

 $m \angle 1 = 120^{\circ}$

Find the missing angle measures:



$$m \angle A = 75^{\circ}$$
$$m \angle B = 105^{\circ}$$
$$m \angle C = 105^{\circ}$$
$$m \angle D = 75^{\circ}$$
$$m \angle E = 75^{\circ}$$
$$m \angle F = 105^{\circ}$$

 $m \angle G = 105^{\circ}$