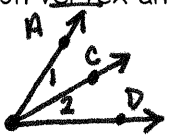
Honors Geometry
Notes - Section 1.4 Pairs of Angles

Name KEY
Date _____ Period _____

Adjacent Angles: Two angles in the same plane with a common vertex and a common side, but no common interior points.



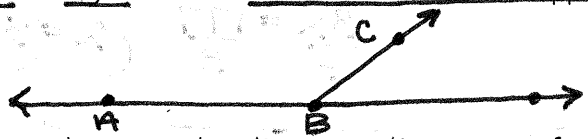
$\overrightarrow{BC}$ is the common side

Common Vertex → B

$\angle ABC$ & $\angle DBC$ are adjacent angles

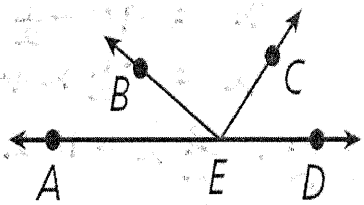
Linear Pair: A pair of adjacent angles whose noncommon sides are opposite rays.

$\angle ABC$ & $\angle CBD$ are a linear pair.



angles sum to 180°
$m\angle ABC + m\angle CBD = 180°$

Example 1: Tell whether the angles are only adjacent, adjacent and form a linear pair, or not adjacent.

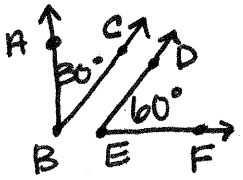


a. $\angle AEB$ and $\angle BED$ adjacent, linear pair

b. $\angle AEB$ and $\angle BEC$ adjacent

c. $\angle DEC$ and $\angle AEB$ neither

Complementary Angles: Two angles whose measures have a sum of 90 degrees.

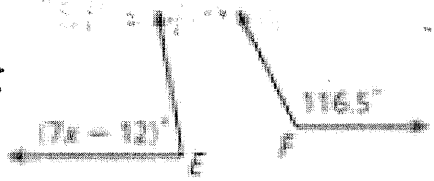


$\angle ABC$ & $\angle DEF$ are complementary angles.

How can the complement of an angle be found?

subtract from 90° $(90 - x)°$

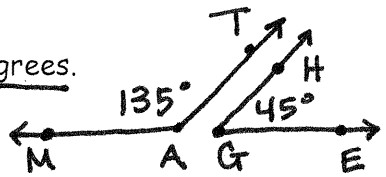
Example 2: Use the figure at the right...



a. Find the complement of $< F$. No complement already measures more than 90°

b. Find the complement of $< E$. $90 - (7x-12)$
$90 - 7x + 12$
$(-7x + 102)°$

Supplementary Angles: Two angles whose measures have a sum of 180 degrees.



How can the supplement of an angle be found?

subtract from 180° $(180 - x)°$

Example 3: Using the same figure...

a. Find the supplement of $< F$. $180 - 116.5 = 63.5°$

b. Find the supplement of $< E$. $180 - (7x-12)$
$180 - 7x + 12$
$(-7x + 192)°$

Using Complements and Supplements to Solve Problems

"x" =

Example 4: An angle measures 3 degrees less than twice the measure of its complement. Find the measure of the complement.

$x = 2(90-x)-3$

$x = 180-2x-3$

$x = -2x+177$

$\frac{3x}{3} = \frac{177}{3}$

$x = 59°$ ← angle

$90-59 = 31°$ ← complement

"x" =

Example 5: An angle's measure is 12 degrees more than $\frac{1}{2}$ the measure of its supplement. Find the measure of the angle.

$x = \frac{1}{2}(180-x)+12$

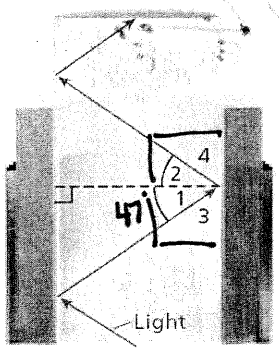
$x = 90-\frac{1}{2}x+12$

$x = -\frac{1}{2}x+102$

$\frac{2}{3}\cdot\frac{3}{2}x = 102\cdot\frac{2}{3}$

$x = 68°$ ← angle

Example 6: Light passing through a fiber optic cable reflects off the walls of the cable in such a way that $\angle 1 \cong \angle 2$, $\angle 1$ and $\angle 3$ are complementary, and $\angle 2$ and $\angle 4$ are complementary. If $m\angle 1 = 47°$, find $m\angle 2$, $m\angle 3$, and $m\angle 4$.



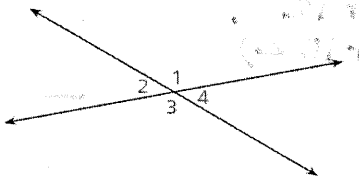
$m\angle 1 = 47°$

$m\angle 2 = 47°$

$m\angle 3 = 43°$

$m\angle 4 = 43°$

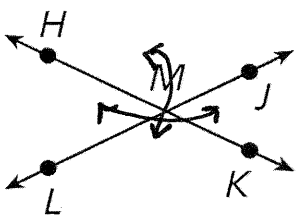
Vertical Angles: Two nonadjacent angles formed by two intersecting lines.



$\angle 1$ & $\angle 3$ are vertical angles, $\angle 1 \cong \angle 3$

$\angle 2$ & $\angle 4$ are vertical angles, $\angle 2 \cong \angle 4$

Example 7: Name the pairs of vertical angles.



$\angle HMJ \cong \angle LMK$

$\angle HML \cong \angle JMK$