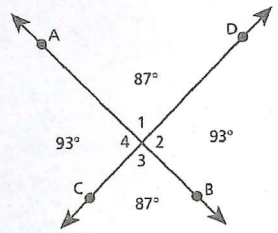
Name: Key

Angle Relationships: All Together Notes

Vertical angles can be thought of as opposite angles. Their sides form two pairs of opposite rays. Vertical angles are the nonadjacent angles formed when two lines intersect.



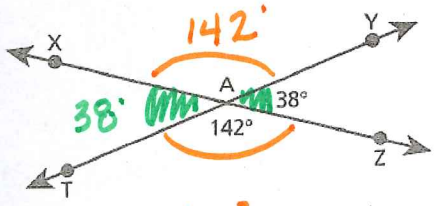
Line AB and line CD intersect.

Angle 1 and angle 3 are vertical angles.
Angle 2 and angle 4 are vertical angles.

Vertical angles are congruent. The angle measure for each vertical angle pair will be the same.
Adjacent angles are supplementary.
$\angle 1 + \angle 2 = 180°$
$\angle 3 + \angle 4 = 180°$

Vertical Angles and Linear Pairs Example 1:

Directions: Use vertical angles to determine the missing measures, then name the vertical pairs.



m∠XAY = 142°

m∠XAT = 38°

Vertical Pairs:

∠YAZ and ∠TAX

∠XAY and ∠ZAT

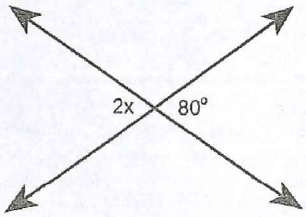
Linear Pairs:

∠YAZ ∠ZAT and ∠ZAT ∠TAX

∠TAX ∠XAY and ∠XAY ∠YAZ

Vertical Angles Example 2:

Directions: Find x



Remember: Vertical ∠s are ≅ So set them = to each other!

$2x = 80$

$\frac{2x}{2} = \frac{80}{2}$

$\boxed{x = 40}$

Linear Pairs Example 3:

Directions: Find y

If <12 and <13 are linear pairs, $< 12 = y + 10$ *and* $< 13 = 3x + 10$.

Linear pairs are suppl. So add them up and set them = to 180°

$\angle 12 + \angle 13 = 180$

$y + 10 + 3x + 10 = 180$

$4x + 20 = 180$

$-20 \quad -20$

$\frac{4x}{4} = \frac{160}{4}$

$\boxed{x = 40}$

Find Missing Angle Measurements Review- Example 4:
Directions: Use your understanding of complementary, supplementary and linear pairs to find the missing measures.

a.) If <10 and <11 are complementary angles, m<10=32° then

m<11 = 58°

$32 + \angle 11 = 90°$
$-32 \quad -32$

b.) If <14 and <15 are supplementary angles, m<14=68° then

m<15 = 112°

$68 + \angle 15 = 180$
$-68 \quad -68$

c.) If <M and <P are linear pairs, m<M=67° then

m<P = 113°

$\angle M + \angle P = 180°$
linear pairs are suppl.
$67 + \angle P = 180°$
$-67 \quad -67$

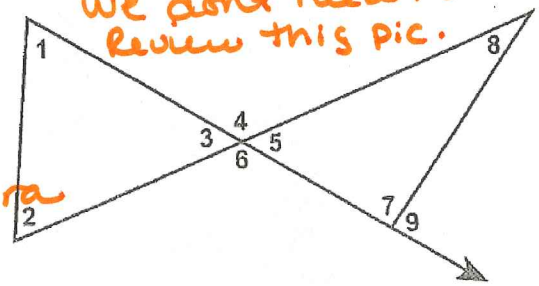
d.) If <5 and <6 are complementary angles, <6 and <7 are supplementary angles, and m<5=34° then

$\angle 5 + \angle 6 = 90°$
$34 + \angle 6 = 90$
$-34 \quad -34$
$\angle 6 = 56°$

$\angle 6 + \angle 7 = 180°$
$56 + \angle 7 = 180$
$-56 \quad -56$
$\angle 7 = 93°$

m<6 = 56° and m<7 = 93°

Find Missing Angle Measurements Review- Example 5:
Directions: Use your understanding of complementary, supplementary and linear pairs to find the missing measures.



we don't need to review this pic.

a.) <10 and <11 are complementary angles.
$m\angle 10 = x$ and $m\angle 11 = x + 20$. Find x.

$\angle 10 + \angle 11 = 90°$ ← study this! Not just algebra

$x + x + 20 = 90$
$2x + 20 = 90$
$-20 \quad -20$
$\frac{2x}{2} = \frac{70}{2}$
$x = 35$

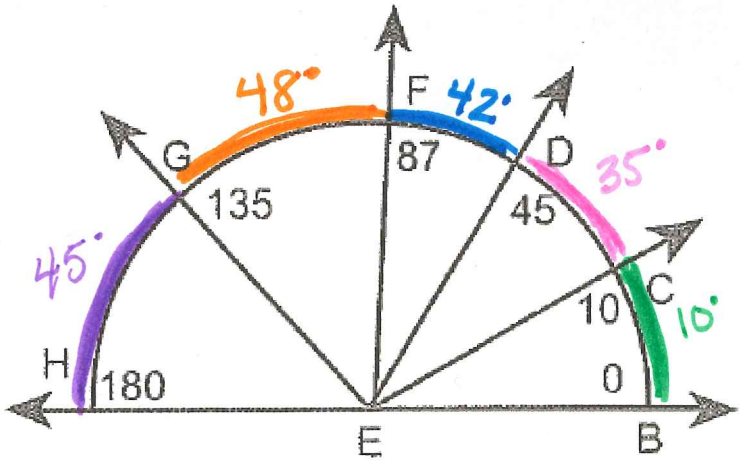
b.) <12 and <13 are ~~complementary~~ suppl. = 180 angles.
$m\angle 12 = 2y$ and $m\angle 13 = 3y - 15$. Find y.

$\angle 12 + \angle 13 = 180$
$2y + 3y - 15 = 180$
$5y - 15 = 180$
$5y = 195$
$y = 39$

Congruence of Angles and Addition Properties Review - Example 6:
Directions: Find the values of each of the following.

a.) $m < BEC + m < CEF =$

$10 + (42+35) = 87°$



b.) $m < GEB - m < DEB =$

$135 - 45 = 90°$

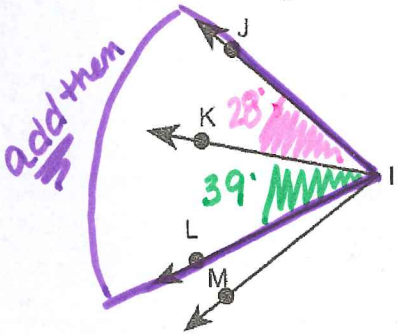
c.) $m < HEG + m < CEF - m < BEC =$

$45 + (42+35) - 10 = 112°$

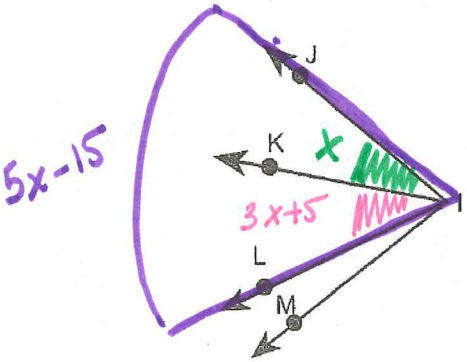
Congruence of Angles and Addition Properties Review - Example 7:
Directions: Find the values of each of the following.

a.) $m < KIJ = 28°$, $m < LIK = 39°$
Find $m < LIJ$.

$28 + 39° = 67°$



b.) $m < JIK = x°$, $m < LIK = (3x + 5)°$ and $m < JIL = (5x - 15)°$, Find x.



$< JIK + < LIK = < JIL$

$x + 3x+5 = 5x-15$

$4x + 5 = 5x - 15$

$-4x \quad -4x$

$5 = 1x - 15$

$+15 \quad +15$

$\boxed{20 = x}$

HOMEWORK: You have the option to do ALL questions if you would like extra practice, however, you are required to complete all of the following.

Pg 30: Vertical Angles
Complete #2-4

Pg 32: Find Missing Angle Measurements
Complete all EVERN numbers

Pg 10: Congruence of Angles and Addition Properties
Complete 1-19 odds only and 20-22 ALL
********READ THIS!!!!!!*******Must show ALL work on separate paper for # 20-22, you must bring in the separate paper for credit- you MAY NOT earn credit if you lose or leave your separate paper at home.*

Pg. 11: Classifying Angles
Complete #1-6, 11-13
********READ THIS!!!!!!*******Must show ALL work on separate paper for #6, you must bring in the separate paper for credit- you MAY NOT earn credit if you lose or leave your separate paper at home.*