Angle Relationships Notes Day 2

Key

Quadratics Warm-Up.

Directions: Solve through factoring.

1. $0 = 8x^2 - 6x - 9$.

$8 \cdot 9 = -72$

$\square \cdot \square = -72$

$-12 + 6 = -6$

$(x - \frac{12}{8})(x + \frac{6}{8}) = 0$

$(x - \frac{3}{2})(x + \frac{3}{4}) = 0$

$(2x - 3)(4x + 3) = 0$

$x = 1.5$ or $x = -.75$

2. $0 = 7x^2 + 22x + 3$.

$7 \cdot 3 = 21$

$\square \cdot \square = 21$

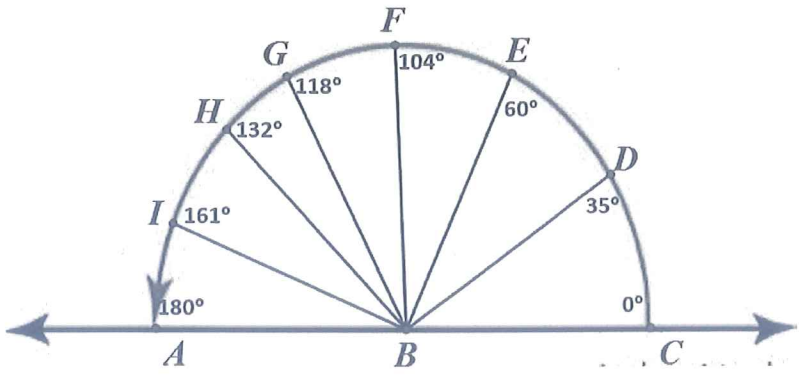
$21 + 1 = 22$

$(x + \frac{21}{7})(x + \frac{1}{7}) = 0$

$(x + 3)(7x + 1) = 0$

$x = -3$ $x = -\frac{1}{7}$

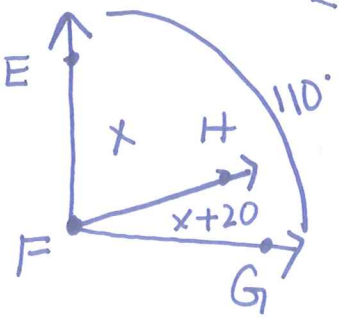
Angle Warm-up:
Find the measure of the following angles.



1. m<CBE = 60°
2. m<HBD= 132 - 35 = 97°
3. m<ABI = 180 - 161 = 19°
4. m<ABC = 180°
5. m<FBA = 180 - 104 = 76°
6. m<DBI = 161 - 35° = 126°

Angle Addition Examples:

1. $\angle EFH$ is adjacent to $\angle HFG$. $\angle EFH = x°$, $\angle HFG = x + 20$ and $\angle EFG = 110°$. Find x, $m\angle EFH$ and $m\angle HFG$. Draw the figure 1st.



Geometry:

$\angle EFH + \angle HFG = \angle EFG$

$x + x + 20 = 110$

$2x + 20 = 110$

$2x = 90$

$x = 45°$

Justify:

angle addition → substitution

2. $\overrightarrow{BA}$ and $\overrightarrow{BC}$ are opposite rays, which means ⟷ **. $\overrightarrow{BF}$ bisects <CBE and $\overrightarrow{BD}$ bisects <ABE. Justify your steps.**

What does it mean to bisect an angle? cut ∠ into 2 ≅ ∠s

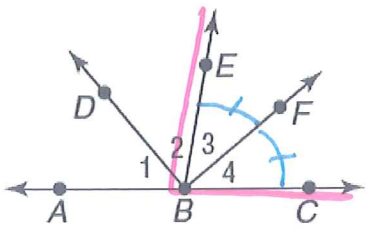
If $m < EBF = 6x + 4$ and $m < CBF = 7x - 2$, find $m < EBC$.

∠EBF ≅ ∠CBF — def of ∠ bisector

$6x + 4 = 7x - 2$

$4 = x - 2$

$6 = x$

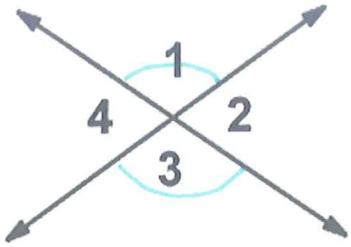


∠EBF + ∠CBF = ∠EBC angle addition

$6(6) + 4 + 7(6) - 2 = \angle EBC$

$83° = \angle EBC$

3. If $\angle 1 = (x - 4)^2$ and $\angle 3 = 9°$, find the possible value(s) of x, ∠1, and ∠2. Note: This figure is not drawn to scale.



∠1 ≅ ∠3 — vertical ∠s are ≅

$(x-4)^2 = 9$

$(x-4)(x-4) = 9$

$x^2 - 4x - 4x + 16 = 9$

$x^2 - 8x + 16 = 9$

$x^2 - 8x + 7 = 0$

$(x - 7)(x - 1) = 0$

$x = 7$ $x = 1$

must check work

$x = 7$

$(7-4)^2 = 9$?

$(3)^2 = 9$

$9 = 9$ ✓ yes!

$x = 1$

$(1-4)^2 = 9$?

$(-3)^2 = 9$

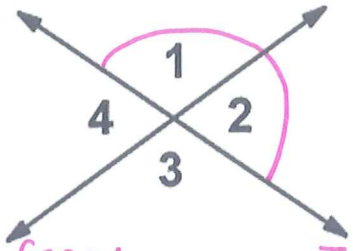
$9 = 9$ ✓ yes!

$\angle 1 = 9°$

∠2 + ∠1 = 180 linear pairs are suppl.

$\angle 2 = 171°$

4. If $\angle 1 = x^2 + 2x$ and $\angle 2 = 4x + 140$, find the possible value(s) of x, $\angle 3$, and $\angle 4$. Note: This figure is not drawn to scale.



Geo: $\angle 1 + \angle 2 = 180$

Justify: linear pairs are suppl.

$x^2 + 2x + 4x + 140 = 180$

$x^2 + 6x + 140 = 180$

$x^2 + 6x - 40 = 0$

$(x-4)(x+10) = 0$

$x = 4$ | $x = -10$

Check work

$x = 4$

$\angle 1 = 4^2 + 2(4) = 24°$

$\angle 2 = 4(4) + 140 = 156°$

$24 + 156 = 180$ yes!

$x = -10$

$\angle 1 = (-10)^2 + 2(-10) = 80°$

$\angle 2 = 4(-10) + 140 = 100°$

$80 + 100 = 180$ yes!

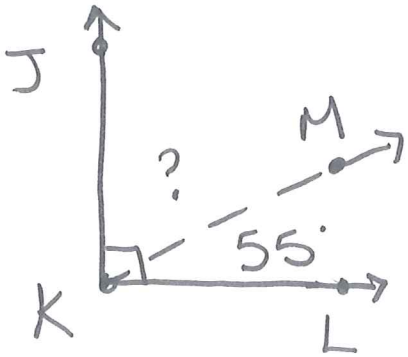
$\angle 3 \cong \angle 1$ vertical $\angle$s are $\cong$

$\angle 3 = 24°$ or $\angle 3 = 80°$

$\angle 4 \cong \angle 2$ vertical $\angle$s are $\cong$

$\angle 4 = 156°$ or $\angle 4 = 100°$

5. $\angle JKM$ is adjacent to $\angle MKL$. $\angle JKL$ *is a right angle* and $\angle MKL = 55°$. Find $m\angle JKM$. Draw the figure 1st.



$\angle JKL = 90°$ def of Right $\angle$

$\angle JKM + \angle MKL = \angle JKL$ angle addtn

$\angle JKM + 55° = 90$

$\angle JKM = 35°$