Special Pairs of Angles

Complementary Angles:

2 angles whose sum is 90°.
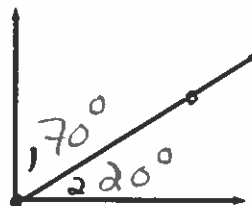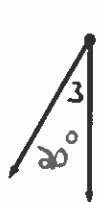
∠1 and ∠3 are complementary.

∠1 and ∠2 are adjacent complementary.

Adjacent Complementary

Supplementary Angles:

2 angles whose sum is 180°.

∠1 and ∠2 are adjacent supplementary.

∠2 and ∠3 are supplementary.
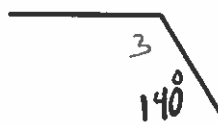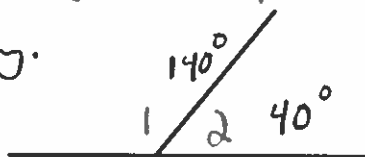
Vertical Angles:

When 2 lines intersect, the following are called vertical ∠s:

∠1 and ∠3 are vertical ∠s
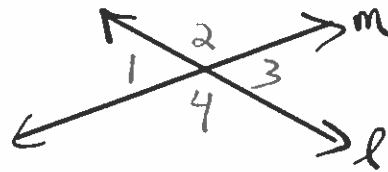
∠2 and ∠4 are vertical ∠s

1
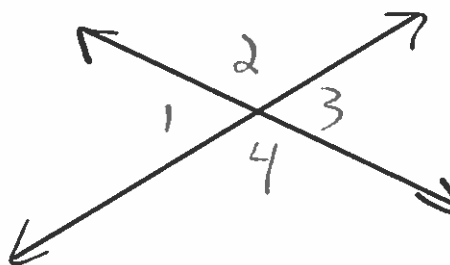
Vertical Angles Theorem

Vertical angles are congruent.

Given: ℓ and m intersect

Prove: $\angle 2 \cong \angle 4 \; ; \; \angle 1 \cong \angle 3$

Statements	Reasons
1. ℓ and m intersect	Given
2. $m\angle 1 + m\angle 2 = 180°$ $m\angle 2 + m\angle 3 = 180°$	$\angle$ Add. Post.
3. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	Trans. Prop. of $=$
4. $\quad m\angle 2 = m\angle 2$	Refl. Prop. of $=$
5. $\quad m\angle 1 = m\angle 3$	Subtr. Prop. of $=$ $(3-4)$
6. $\quad\quad \angle 1 \cong \angle 3$	Def. $\angle \cong \angle s$

Likewise, $\angle 2 \cong \angle 4$.

Solve each problem.

Define your variables and justify your initial equations.

Ex 1: The measure of an angle is twice as large as its complement.
Find the measure of both angles.

$\boxed{1}$ $x = $ orig $\angle$

$90 - x = $ comp $\left[\begin{array}{c}\text{Def. of}\\\text{Comp. } \angle s\end{array}\right]$

$\boxed{2}$ orig $= 2($comp$.)\left[\text{Given}\right]$

$x = 2(90 - x)$

$x = 180 - 2x$

$3x = 180$

$x = 60$

$\boxed{3}$ $\begin{array}{l} \text{Orig} = 60° \\ \text{Comp} = 30° \end{array}$

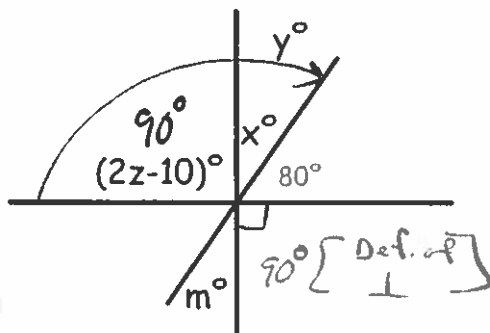Ex 2:   The measure of a supplement of an angle is 12 more than twice the measure of the angle.

Find the measure of the angles and its supplement.

① $x = $ orig $\angle$

$180 - x = $ supp

$\lceil$ Def. of supp. $\angle s \rceil$ *

② $Supp = 2(orig) + 12$ ⟦ Given ⟧ ✗

$180 - x = 2(x) + 12$

$-3x = ^-168$

$x = 56$

③ $\boxed{\begin{array}{l} orig = 56° \\ Supp = 124° \end{array}}$

Find the value of each variable. Justify your initial equations.

$90°$
$y°$
$x°$
$(2z-10)°$
$80°$
$m°$ $90° \lceil \begin{array}{c} Def. of \\ \perp \end{array} \rceil$

Ⅱ $2z-10 = 90° \left[\begin{array}{c} vert. \angle s / Def \, of \\ Thm / \cong \angle s \end{array} \right]$

$2z = 100$

$\boxed{z = 50}$

ⓐ $x + 80 + 90 = 180°$ ⟦ $\angle$ Add Post ⟧

$\boxed{x = 10}$

③ $x = m \left[\begin{array}{c} vert. \angle s / Def. of \\ Thm / \cong \angle s \end{array} \right]$

$\boxed{m = 10}$

④ $y = (2z - 10) + x$ ⟦ $\angle$ Add. Post. ⟧

$y = 100 - 10 + 10$

$\boxed{y = 100}$

Assignment #16

Read and Take Notes on p. 50-51.

Complete p. 52-53 CE #10-19, 21
                      WE #13-18, 20, 21-27 odd, 30-33.
            Justify all equations!