2.2. Honors Geometry

DATE: 9/19

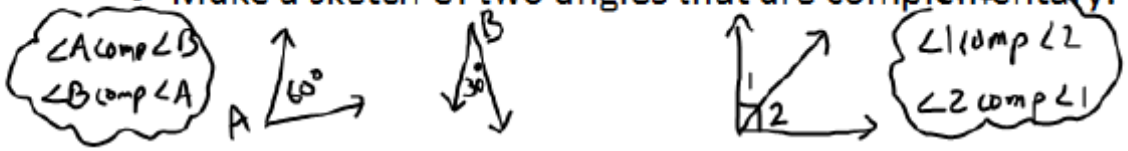
Target 2B. Recognize angle pairs and use them to solve problems.

Complementary Angles: two angles that have a sum of 90° or form a right angle.

- Write the definition as a conditional statement:
  If the sum of two ∠s forms a right ∠, then they are complementary.

- Write the converse:
  If two ∠s are complementary, then their sum forms a right ∠.

- Make a sketch of two angles that are complementary:



Supplementary Angles: two angles that have a sum of _____ or form a _____ angle.

Supplementary Angles: two angles that have a sum of 180° or form a straight angle.

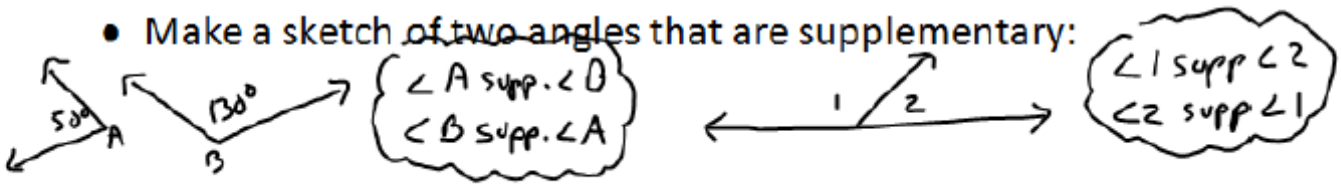
- Write the definition as a conditional statement:

If the sum of two ∠s forms a straight ∠, then they are supplementary.

- Write the converse:

If two ∠s are supplementary, then their sum forms a straight ∠.

- Make a sketch ~~of two angles~~ that are supplementary:



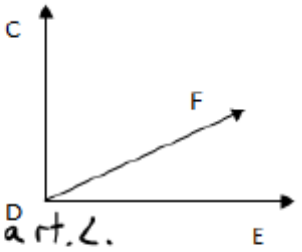
Example

1) What is the supplement of a 35° angle? Complement of 35° angle? The supplement of 35°∠ is 180−35° = 145° ✓

The complement of 35° ∠ is 90−35° = 55° ✓

2) Given: $\overrightarrow{CD} \perp \overrightarrow{DE}$

Prove: $\angle CDF$ is comp to $\angle FDE$



Statement	Reason
(1) $\overrightarrow{CD} \perp \overrightarrow{DE}$	(1) Given
(2) $\angle CDE$ is rt.	(2) If two rays are $\perp$, then they form a rt. $\angle$.
(3) $\angle CDF$ is comp to $\angle FDE$	(3) If the sum of two $\angle$s is a rt. $\angle$, then they are comp.

3) The measure of one of two complementary angles is three greater than twice the measure of the other. Find the larger angle.

Let x = measure of on $\angle$. Complementary means two $\angle$s add up to 90°.

$x + 2x + 3 = 90$

$3x + 3 = 90$
$-3 \quad -3$

$\frac{3x}{3} = \frac{87}{3}$ $(x = 29)$

The smaller $\angle$ is x, so 29°

The larger $\angle$ is $2x + 3 = 2(29) + 3 = 61°$

4) The supplement of an angle is 30 less than four times the complement of the angle. Find the measure of the complement

4) Two supplementary angles are in the ratio of 2:7. Find the measure of each angle.

$\rightarrow 2x : 7x$

$2x + 7x = 180$

$\frac{9x}{9} = \frac{180}{9}$ $\quad x = 20$

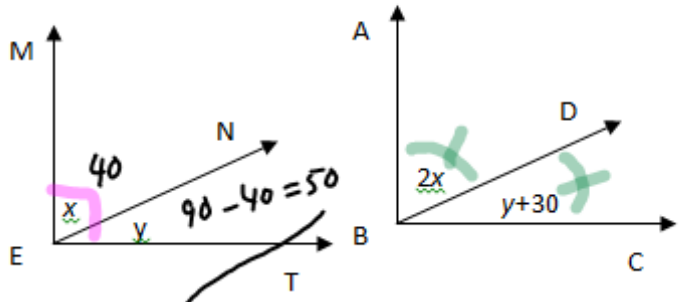
$1^{st}\angle = 2(20) = 40°$ ✓

$2^{nd}\angle = 7(20) = 140$ ✓

5) Given: $\overline{ME} \perp \overline{ET} \Rightarrow \angle MET = 90°$

$\overline{BD}$ bisects $\angle ABC \Rightarrow \angle ABD \cong \angle DBC$

Find: $\angle ABC$



$x + y = 90$

$2x = y + 30$

$-y \quad -y$

$2x - y = 30$

$1x + y = 90$

$+2x - y = 30$

$\frac{3x}{3} = \frac{120}{3}$

$x = 40$

$y = 50$

$\angle ABC = 2x + y + 30$

$= 2(40) + (50) + 30$

$= 160°$ ✓