

## 2.2. Honors Geometry

DATE: 9/19

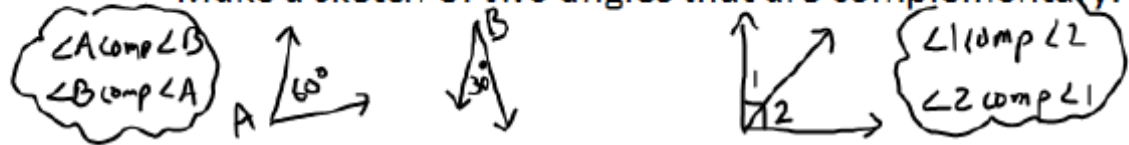
Target 2B. Recognize angle pairs and use them to solve problems.

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  $\angle$ s forms a right  $\angle$ , then they are complementary.

• Write the converse:  
If two  $\angle$ s are complementary, then their sum forms a right  $\angle$ .

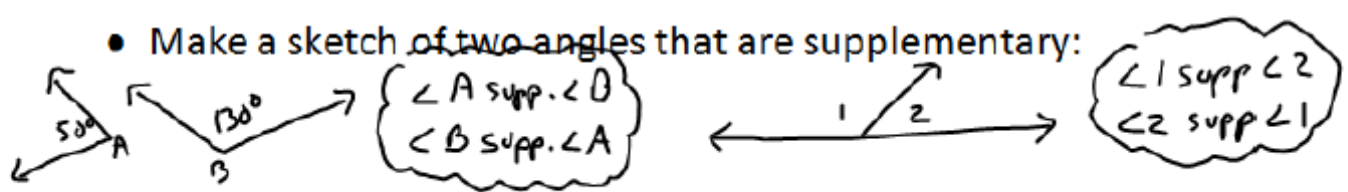
• Make a sketch of two angles that are complementary:



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

Supplementary Angles: two angles that have a sum of  $180^\circ$  or form a straight angle.

- Write the definition as a conditional statement:  
If the sum of two  $\angle$ s forms a straight  $\angle$ , then they are supplementary.
- Write the converse:  
If two  $\angle$ s are supplementary, then their sum forms a straight  $\angle$ .
- Make a sketch of two angles that are supplementary:



Example

1) What is the supplement of a  $35^\circ$  angle? Complement of  $35^\circ$  angle? The supplement of  $35^\circ \angle$  is  $180 - 35^\circ = 145^\circ \checkmark$   
The complement of  $35^\circ \angle$  is  $90 - 35^\circ = 55^\circ \checkmark$

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October 03 2012 H.gwb - 3/4 - Wed Oct 03 2012 07:07:27

2.2 Complements & Supplements [Compatibility Mode] - Microsoft Word

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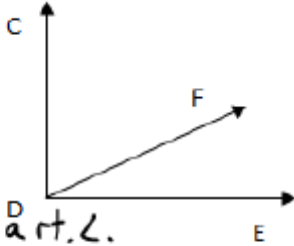
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2) Given:  $\overline{CD} \perp \overline{DE}$

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



Statement	Reason
① $\overline{CD} \perp \overline{DE}$	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 one  $\angle$ . Complementary means two  $\angle$ s add up to  $90^\circ$ .

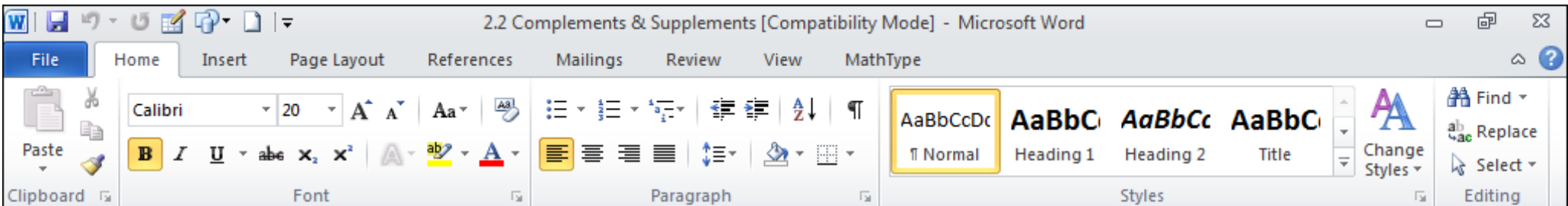
$$x + 2x + 3 = 90$$

$$\begin{array}{r} 3x + 3 = 90 \\ -3 \quad -3 \\ \hline 3x = 87 \\ \frac{3x}{3} = \frac{87}{3} \quad (x = 29) \end{array}$$

The smaller  $\angle$  is  $x$ , so  $29^\circ$

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

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.

$$2x + 7x = 180$$

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

$$\hookrightarrow 2x : 7x$$

$$1^{st} \angle = 2(20) = 40^\circ \checkmark$$

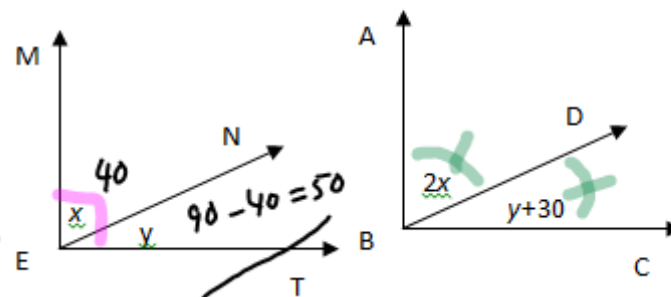
$$2^{nd} \angle = 7(20) = 140^\circ \checkmark$$

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

$\overline{BD}$  bisects  $\angle ABC$

Find:  $\angle ABC$

$\Rightarrow \angle ABD \cong \angle DBC$



$$\begin{array}{r} x + y = 90 \\ 2x = y + 30 \\ \hline -y \quad -y \\ \hline 2x - y = 30 \end{array}$$

$$\begin{array}{r} |x + y| = 90 \\ + 2x - y = 30 \\ \hline 3x = 120 \\ \frac{3x}{3} = \frac{120}{3} \end{array}$$

$x = 40$   
 $y = 50$

$$\begin{aligned} \angle ABC &= 2x + y + 30 \\ &= 2(40) + (50) + 30 \\ &= 160^\circ \checkmark \end{aligned}$$