

Lesson 1-7 R - Sum of Angles

Agenda

- Check and Review Homework 1-6
- *Need Pouch
- Lesson 1-7 Notes
- Take out Lesson Summary/Outline
- Quiz

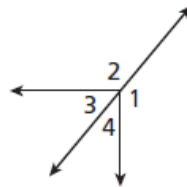
Homework - Day 7

Complete Worksheet 1-7

PRACTICE AND PROBLEM SOLVING

Tell whether the angles are only adjacent, adjacent and form a linear pair, or not adjacent.

14. $\angle 1$ and $\angle 4$ **adj.;** 15. $\angle 2$ and $\angle 3$ **adj.;** **lin. pair**
 16. $\angle 3$ and $\angle 4$ **lin. pair** 17. $\angle 3$ and $\angle 1$ **not adj.**
only adj.



Given $m\angle A = 56.4^\circ$ and $m\angle B = (2x - 4)^\circ$, find the measure of each of the following.

18. supplement of $\angle A$ **123.6°** 19. complement of $\angle A$ **33.6°**
 20. supplement of $\angle B$ **$(184 - 2x)^\circ$** 21. complement of $\angle B$ **$(94 - 2x)^\circ$**
 22. **Multi-Step** An angle's measure is 3 times the measure of its complement.
 Find the measure of the angle and the measure of its complement. **67.5° ; 22.5°**

32. The measure of an acute \angle is less than 90° . Therefore the measure of its supp. must be between 90° and 180° , which means the supp. is an obtuse \angle .

32. **Critical Thinking** Explain why an angle that is supplementary to an acute angle must be an obtuse angle.



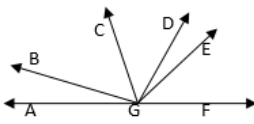
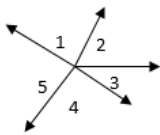
33. This problem will prepare you for the Multi-Step Test Prep on page 34. H is in the interior of $\angle JAK$. $m\angle JAH = (3x - 8)^\circ$, and $m\angle KAH = (x + 2)^\circ$. Draw a picture of each relationship. Then find the measure of each angle.
- $\angle JAH$ and $\angle KAH$ are complementary angles. $m\angle JAH = 64^\circ$; $m\angle KAH = 26^\circ$
 - $\angle JAH$ and $\angle KAH$ form a linear pair. $m\angle JAH = 131.5^\circ$; $m\angle KAH = 48.5^\circ$
 - $\angle JAH$ and $\angle KAH$ are congruent angles. $m\angle JAH = m\angle KAH = 7^\circ$

36. If two angles are supplementary and congruent, the measure of each angle is 90° . **T**
37. If a ray divides an angle into two complementary angles, then the original angle is a right angle. **T**
44. The supplement of an angle is 4 more than twice its complement. Find the measure of the angle. 4°

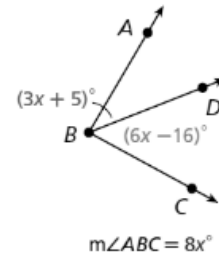
Lesson 1-7K & 1-8L Note Sheet: Sum of Angles at a Point & Consecutive Adjacent Angles on a Line

SOLVING AN EQUATION IN GEOMETRY:

Solving for a variable to determine an angle or segment measure can be done as a proof. A **proof** is an argument that uses logic, definitions, properties, and previously proven statements to show that a conclusion is true.

<p>Note: When doing algebraic operations, we need to deal with <u>segment lengths</u> and <u>angle measures</u>.</p> <p>Remember, always <u>write the equation</u> using <u>segment names or angles first</u> with the reason as the appropriate postulate.</p>	
<p>Segment Addition Postulate</p>  <p>$AB + BC = AC$</p> <p>NOT $\overline{AB} + \overline{BC} = \overline{AC}$</p>	<p>Angle Addition Postulate</p>  <p>$m\angle ABD + m\angle DBC = m\angle ABC$</p> <p>NOT $\angle ABD + \angle DBC \cong \angle ABC$</p>
<p>Consecutive Adjacent Angles on a Line Sum to 180°</p>  <p>$m\angle AGB + m\angle BGC + m\angle CGD + m\angle DGE + m\angle EGF = 180^\circ$</p>	<p>Angles at a Point Sum to 360°</p>  <p>$m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 + m\angle 5 = 360^\circ$</p>

1. (Extend from the Angle Addition Postulate) Given the drawing at right, prove $11=x$.
Write a justification for each non-algebraic step.



$$m\angle ABD + m\angle DBC = m\angle ABC$$

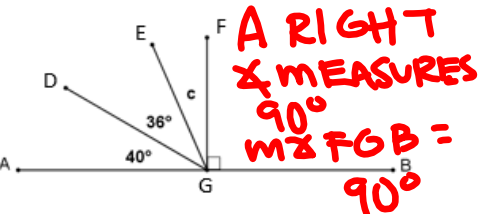
ANGLE ADDITION POSTULATE

$$(3x + 5) + (6x - 16) = 8x \quad \text{SUBSTITUTION}$$

$$9x - 11 = 8x$$

$$x = 11$$

2. Given \overline{AGB} , \overline{DG} , \overline{EG} , and \overline{FG} intersect at G. Find the value of the variable c. Show all and give reasons for each non-algebraic step.



$$m\angle AGD + m\angle DGE$$

$$+ m\angle EGF + m\angle FGB = 180^\circ$$

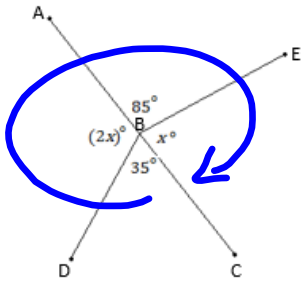
ANGLES ON A LINE SUM TO 180°

$$40^\circ + 36^\circ + c + 90^\circ = 180^\circ \quad \text{SUBSTITUTION}$$

$$c = 14^\circ$$

For the problems below, determine the value of all variables. Show all the steps and reasons for your solution (non-algebraic steps).

3. Not drawn to scale: A, B, and C are not collinear; all the segments intersect at B.



$$m\angle ABE + m\angle EBC + m\angle CBD + m\angle DBA = 360^\circ$$

ANGLES AT A POINT SUM TO 360°

$$85^\circ + x^\circ + 35^\circ + 2x = 360$$

$$3x + 120 = 360$$

$$3x = 240$$

$$x = 80$$

4. \overline{AB} & \overline{CD} intersect at E (Systems)

$$m\angle AED + m\angle DEB = 180^\circ$$

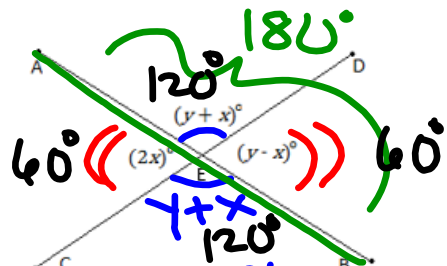
ANGLES ON A LINE SUM TO 180°

$$(y+x) + (y-x) = 180^\circ$$

SUBSTITUTION

$$2y = 180$$

$$y = 90$$



$\angle AED \cong \angle CEB$
VERTICAL ANGLES ARE EQUAL

$$\angle AEC \cong \angle DEB$$

$$2x = y - x$$

SUBSTITUTION

$$3x = y$$

$$3x = 90$$

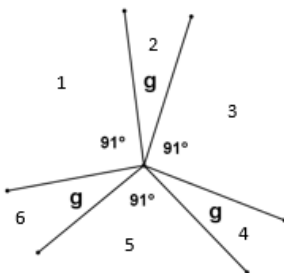
$$x = 30$$

- Take out lesson Summary to use for Quiz
- Hand in Quiz
- work on HW (complete worksheet)

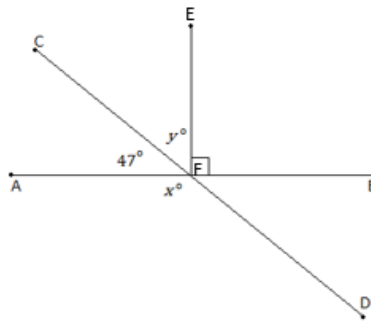
Problem Set

For 7-9, determine the value of x and/or y in each diagram below. Show all the steps and explain your reasoning along the way. If you need help with the systems of equations, refer to your textbook pages 152-153 and the earlier example in the notes.

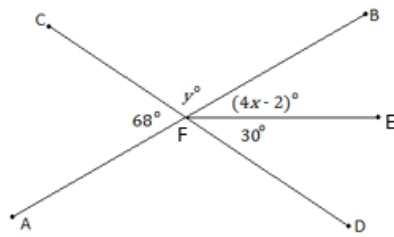
7.



8. $\overline{CD}, \overline{EF}$ & \overline{AB} intersect at F and $m\angle EFB = 90^\circ$



9. \overline{CD} & \overline{AB} intersect at F (System)



10. Given: \overline{FD} bisects $\angle EFB, \angle CFD, \angle AFB$. Determine the value of all the angles.

