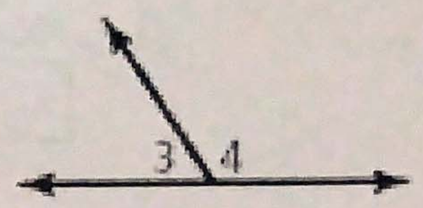
Name Key Date _____ Period ____

Describing Pairs of Angles (continued)

Lesson Objective:

Linear Pairs and Vertical Angles

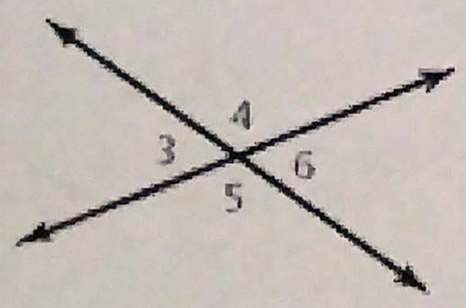
Linear Pair: Two ADJACENT angles are a linear pair when their NONCOMMON sides are OPPOSITE RAYS.



Think About It... What can we conclude about the sum of ∠3 and ∠4? Briefly explain your group's reasoning.

OPPOSITE RAYS FORM A STRAIGHT ANGLE (180°) WHICH MEANS THE ANGLES MUST BE SUPPLEMENTARY.

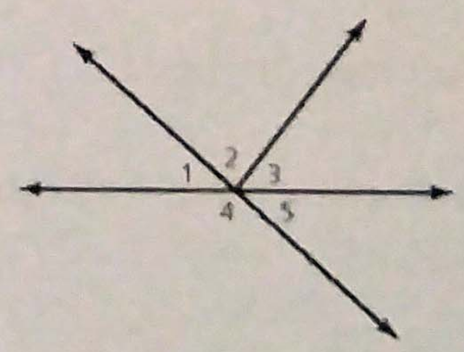
Vertical Angles: Two angles are vertical angles when their sides form two pairs of OPPOSITE RAYS



Examples:

1. Name all the linear pairs in the diagram.

   ∠1 & ∠4, ∠4 & ∠5

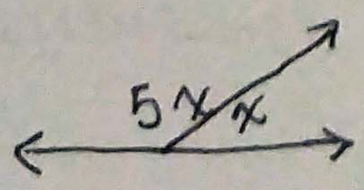


2. Name all the vertical angles in the diagram.

   ∠1 & ∠5

Examples:

3. Two angles form a linear pair. The measure of one angle is five times the measure of the other angle. Find the measure of each angle. Draw a diagram.



$m\angle 1 + m\angle 2 = 180$

$5x + x = 180$

$6x = 180$

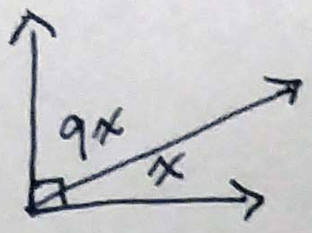
$\boxed{x = 30°}$

$m\angle 1 = 5x$

$= 5(30)$

$\boxed{= 150°}$

4. The measure of an angle is 9 times the measure of its complement. Find the measure of each angle. Draw a diagram.



$m\angle 1 + m\angle 2 = 90$

$9x + x = 90$

$10x = 90$

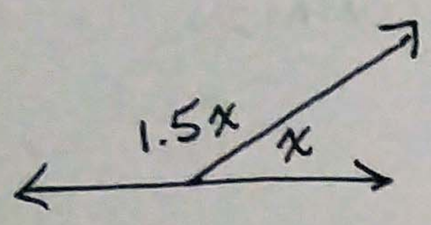
$\boxed{x = 9^\circ}$

$m\angle 1 = 9x$

$= 9(9)$

$\boxed{= 81^\circ}$

5. Two angles form a linear pair. The measure of one angle is 1.5 times the measure of the other angle. Find the measure of each angle.



$m\angle 1 + m\angle 2 = 180$

$1.5x + x = 180$

$2.5x = 180$

$\boxed{x = 72^\circ}$

$m\angle 1 = 1.5x$

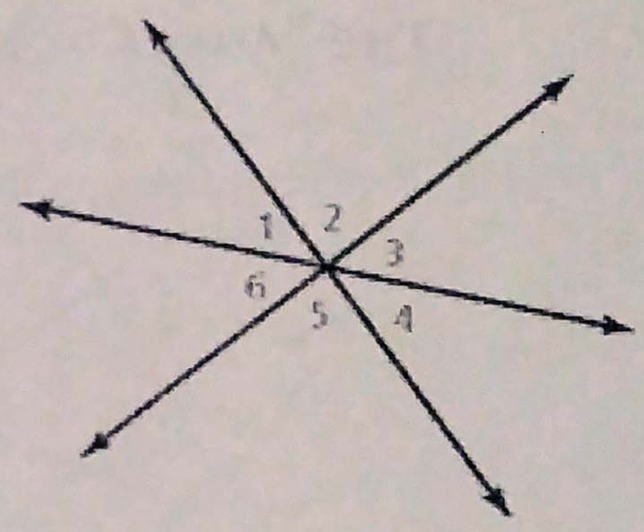
$= 1.5(72)$

$\boxed{= 108^\circ}$

Examples:

6. Do any of the numbered angles form a linear pair? Briefly explain your reasoning.

NO. THERE ARE NO TWO ANGLES THAT ARE SUPPLEMENTARY AND ADJACENT.



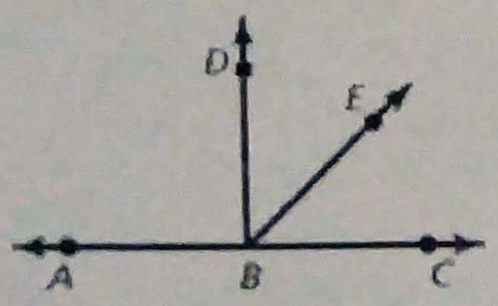
7. Which angles are vertical angles?

$\angle 1$ & $\angle 4$, $\angle 2$ & $\angle 5$, $\angle 3$ & $\angle 6$

What can we conclude from JUST the diagram?

For any diagram, there are some things you can conclude, and some that you cannot. Quickly brainstorm with your group what you think you CAN conclude about the diagram below:

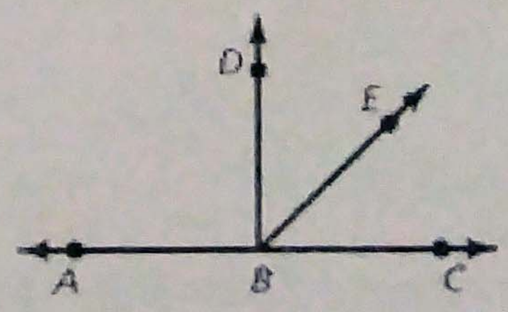
What we CAN conclude:



$\angle ABE$ & $\angle EBC$ ARE A LINEAR PAIR

$\angle ABD$ & $\angle DBC$ FORM A LINEAR PAIR

What we CANNOT conclude:



$\angle ABD$ IS A RIGHT ANGLE

$\angle DBE$ & $\angle EBC$ ARE CONGRUENT