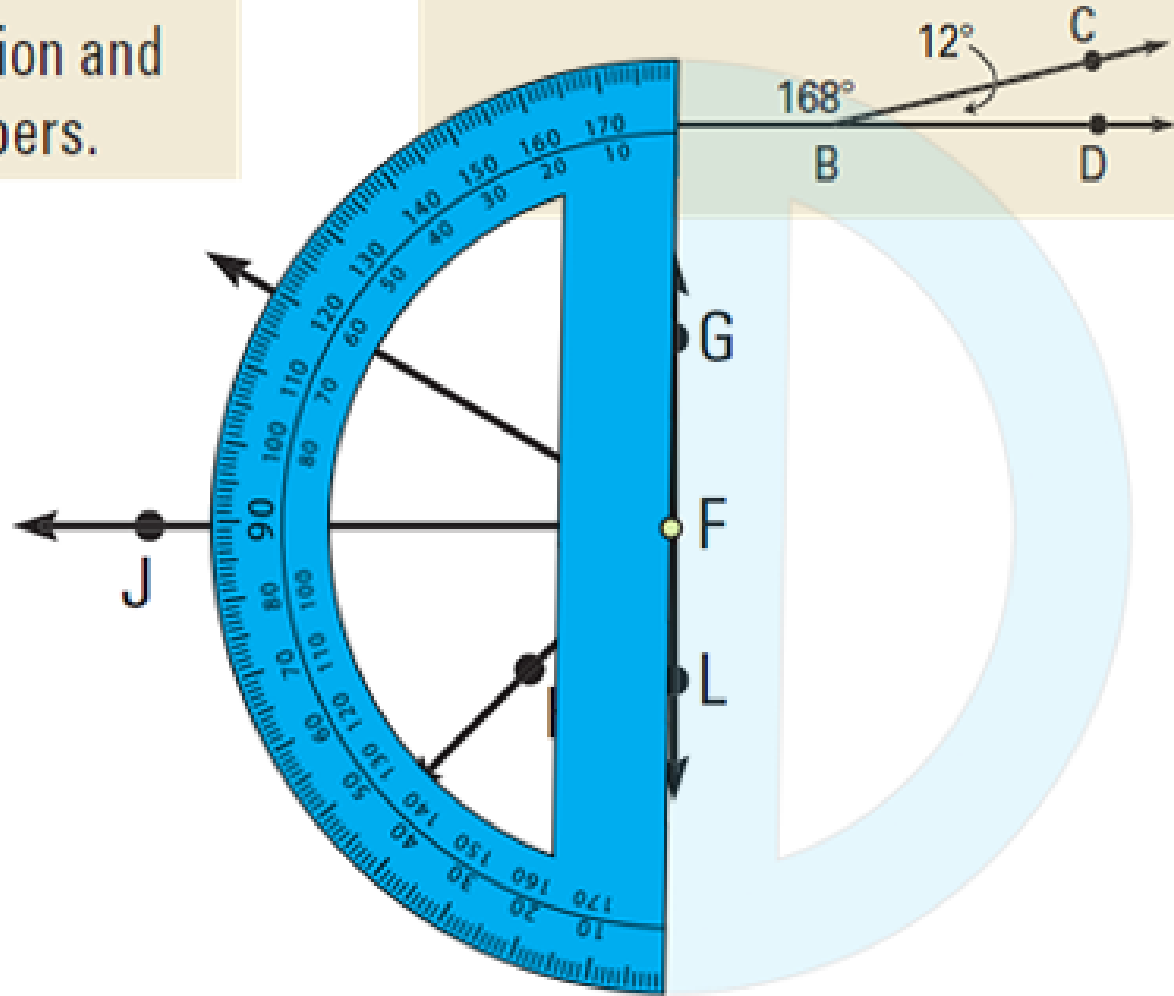


1. The sum of two numbers is 90 and one number is 4 times the other. Write an equation and solve to find the numbers.

2. Find $m\angle ABD$. What kind of angle is it?



1.5 Angle Pair Relationships

complementary angles

2 angles that add to 90° .

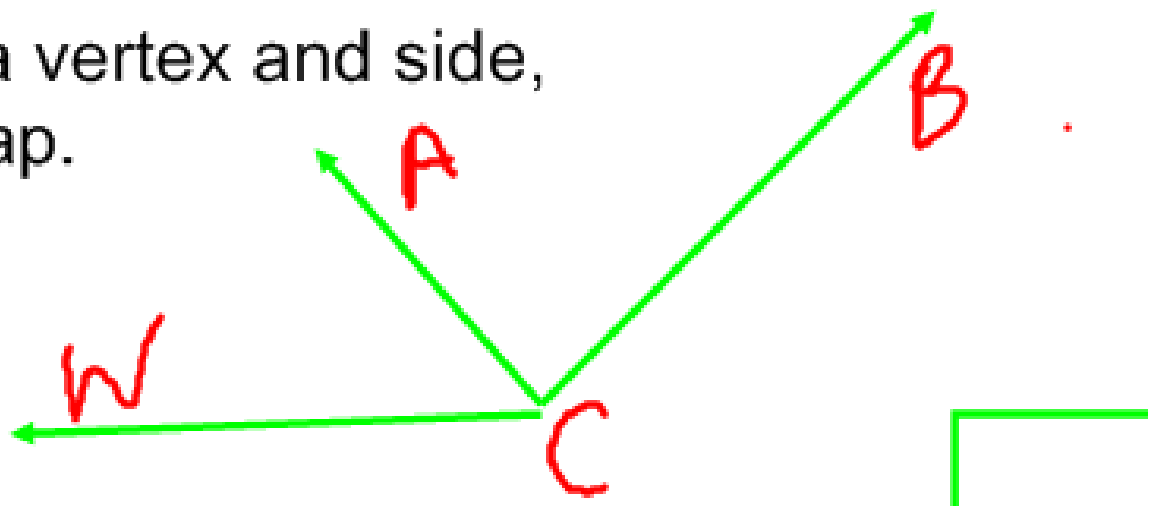
supplementary angles

2 angles that add to 180° .

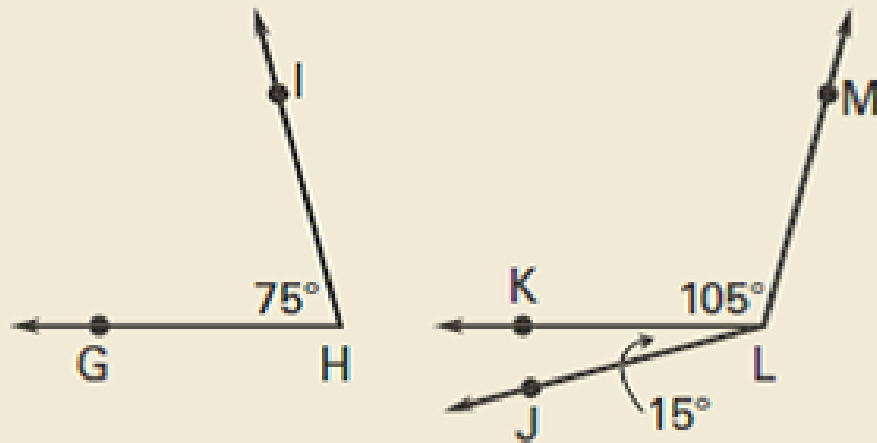
adjacent angles

angles that share a vertex and side,
but DO NOT overlap.

$\angle ACW + \angle ACB$.



In the figure, name a pair of complementary angles, a pair of supplementary angles, and a pair of adjacent angles.



Supplementary

$\angle GHI + \angle KLM$

adjacent

$\angle JLK + \angle MLK$

Complementary

$\angle JLK + \angle GHI$

EXAMPLE 2**Find measures of a complement and a supplement****READ DIAGRAMS**

Angles are sometimes named with numbers.

An angle measure in a diagram has a degree symbol. An angle name does not.

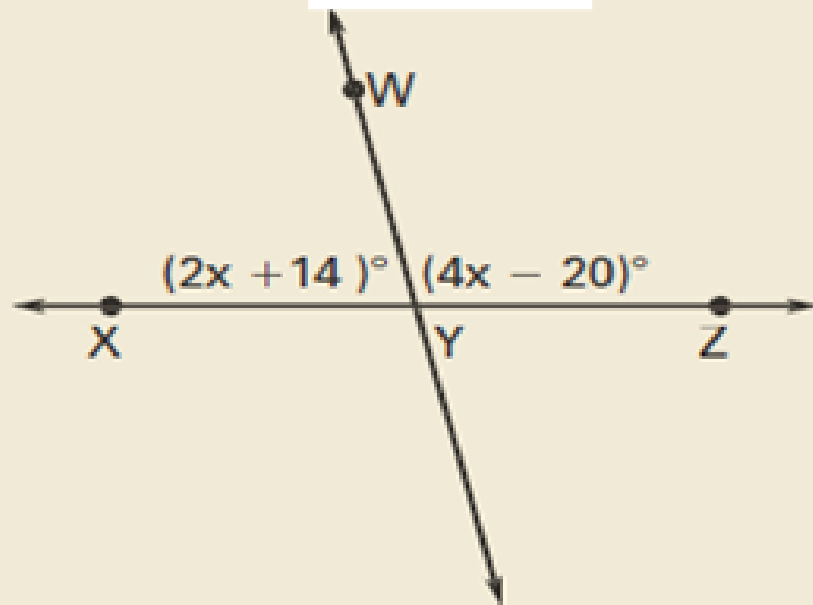
a. Given that $\angle 1$ is a complement of $\angle 2$ and $m\angle 1 = 68^\circ$, find $m\angle 2$.

b. Given that $\angle 3$ is a supplement of $\angle 4$ and $m\angle 4 = 56^\circ$, find $m\angle 3$.

$$\begin{aligned} \text{a. } m\angle 1 + m\angle 2 &= 90 \\ 68 + m\angle 2 &= 90 \\ m\angle 2 &= 22^\circ \end{aligned}$$

$$\begin{aligned} \text{b. } m\angle 3 + m\angle 4 &= 180 \\ m\angle 3 + 56 &= 180 \\ m\angle 3 &= 124 \end{aligned}$$

Two roads intersect to form supplementary angles, $\angle XYW$ and $\angle WYZ$. Find $m\angle XYW$ and $m\angle WYZ$.



$$m\angle XYW + m\angle WYZ = 180$$

$$2x + 14 + 4x - 20 = 180$$

$$6x - 6 = 180$$

$$6x = 186$$

$$x = 31$$

$$m\angle XYW = 2x + 14$$

$$= 2 \cdot 31 + 14$$

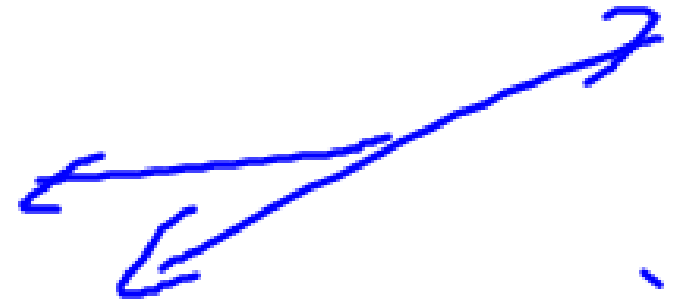
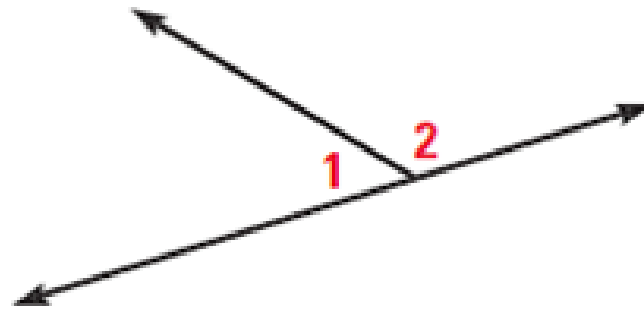
$$= 76^\circ$$

$$180 - 76 = m\angle WYZ = 4x - 20$$

$$= 4 \cdot 31 - 20$$

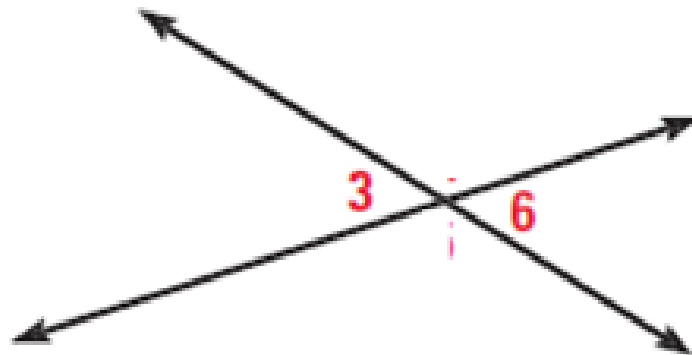
$$= 104^\circ$$

Linear Pair - 2 adjacent angles that are supplementary

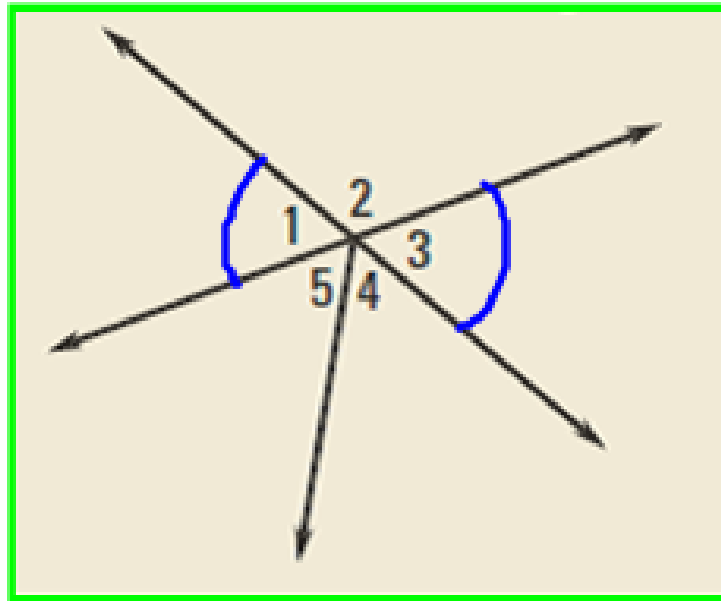


$\angle 1$ and $\angle 2$ are a linear pair.

Vertical Angles - $\angle 3$ and $\angle 6$ are vertical angles.



Identify all of the linear pairs and all of the vertical angles.



linear pair

1. $\angle 1 + \angle 2$

2. $\angle 2 + \angle 3$

vertical angles

1. $\angle 1 + \angle 3$

Algebra example:

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

$a =$ measure of one angle.

$t = 3a =$ measure of the other.

$$a + 3a = 180$$

$$4a = 180$$

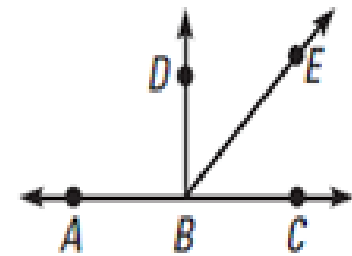
$$a = 45$$

$$3a = 135$$

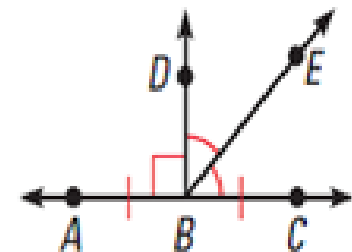
Interpreting a Diagram

There are some things you can conclude from a diagram, and some you cannot. For example, here are some things that you **can conclude** from the diagram at the right:

- All points shown are coplanar.
- Points A , B , and C are collinear, and B is between A and C .
- \vec{AC} , \vec{BD} , and \vec{BE} intersect at point B .
- $\angle DBE$ and $\angle EBC$ are adjacent angles, and $\angle ABC$ is a straight angle.
- Point E lies in the interior of $\angle DBC$.



In the diagram above, you **cannot conclude** that $\overline{AB} \cong \overline{BC}$, that $\angle DBE \cong \angle EBC$, or that $\angle ABD$ is a right angle. This information must be indicated, as shown at the right.



Homework:

p 38-41

#'s 2-5, 6-20 E, 21-23,
32-42 E, 46, 48, 54