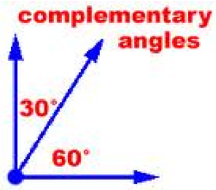
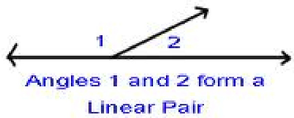
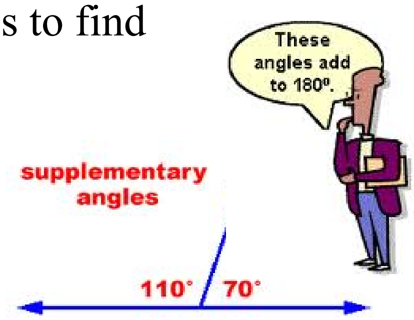
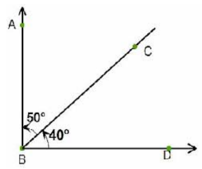
1.5 Describe Angle Pair Relationships

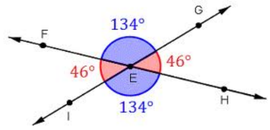
Goal: Use special angle relationships to find angle measures.

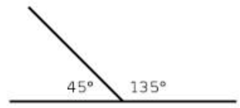








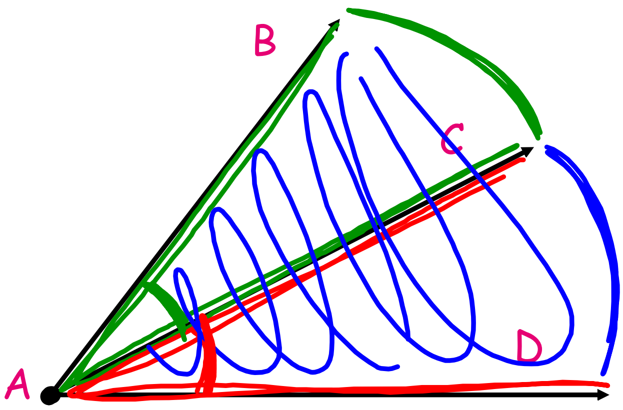


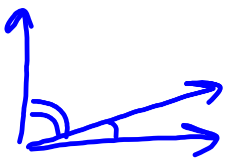


<u>adjacent angles</u> - 2 angles that share a common vertex and side, but have no common interior points

$\angle BAD$

$\overrightarrow{AC}$





adjacent = next to

$\angle BAC$

$\angle CAD$

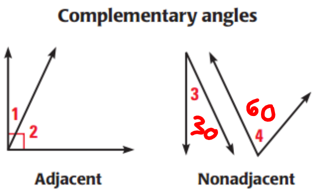
- are next to each other
- share a common side in the interior

Complementary Angles - two angles whose sum is 90
(complements)

the sum of 2 $\angle$'s = 90°

$r+s=90°$ $\boxed{90-x°}$

$\angle 1+\angle 2=90°$



$\angle 1=50°$ $\angle 2=40°$

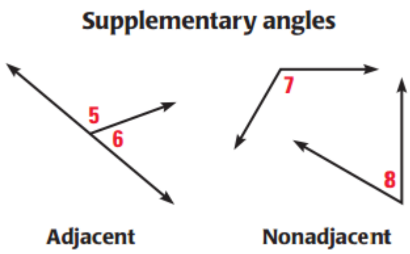
$\angle PMD$ endpoint = M = vertex

$\angle DMP$ Sides = MP

$\angle M$

= MD

Supplementary Angles - two angles whose sum is 180
(supplements)



the sum of 2 $\angle$'s = 180°

$r+s=180°$ $180-x$

$\angle 1+\angle 2=180°$

* $\angle 1 = 6j$

$$\cancel{6j}+\angle 2=180°$$
$$-\cancel{6j} \qquad -6j$$
$$\angle 2 = 180-6j$$

Find measures of a complement and a supplement

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

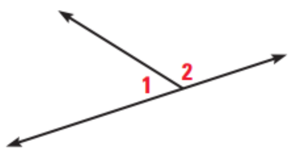
b. Given that $\angle 3$ is a supplement of $\angle 4$ and $m\angle 4 = 56°$, find $m\angle 3$.

a) $90 - 68 = 22°$

b) $180 - 56 = 124°$

Linear Pairs - two adjacent angles whose noncommon sides are opposite rays (they will be supplementary)

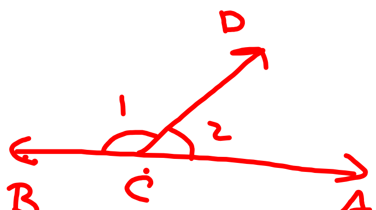
if two angles are linear pairs, then they aresupplementary



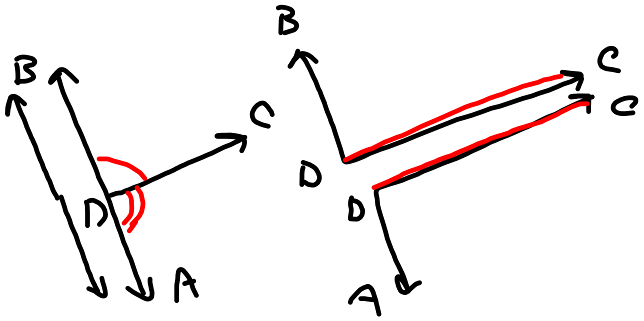
$\angle 1$ and $\angle 2$ are a linear pair.

line
linear pair
supplementary

$\left.\right\}$ 180°

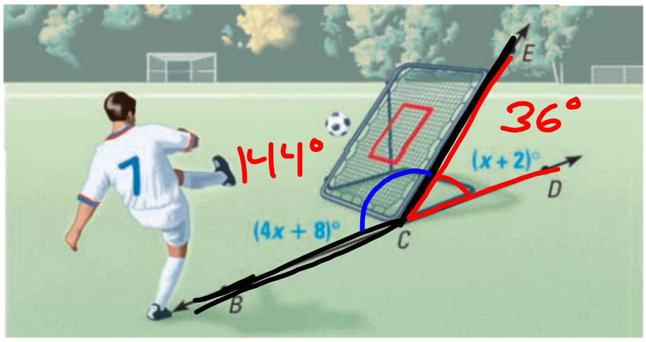


$\angle 1 + \angle 2 = 180°$



Find angle measures

SPORTS When viewed from the side, the frame of a ball-return net forms a pair of supplementary angles with the ground. Find $m\angle BCE$ and $m\angle ECD$.



$4x+8+x+2=180°$

$\angle 1 + \angle 2 = 180°$

$4x+8 + x+2 = 180°$

$5x+10=180°$

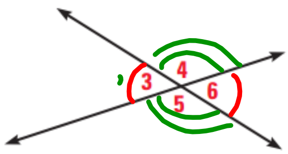
$5x=170°$

$x=34$

$$\begin{array}{r} 180 \\ -\ 36 \\ \hline 144° \end{array}$$

Vertical Angles - two angles where their sides form 2 pairs of opposite rays

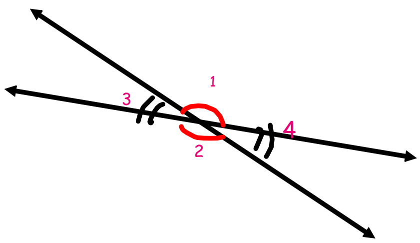
* if two angles are vertical angles, then their measurements are equal



$\angle 3$ and $\angle 6$ are vertical angles.
$\angle 4$ and $\angle 5$ are vertical angles.

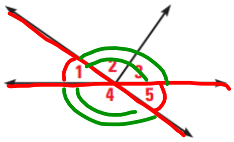
$\angle 1 = \angle 2$

$\angle 3 = \angle 4$



Identify angle pairs

Identify all of the linear pairs and all of the vertical angles in the figure at the right.



$\angle 1$ and $\angle 4$
$\angle 4$ and $\angle 5$

$\angle 1$ and $\angle 5$

Find angle measures in a linear pair

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

$\angle 1 + \angle 2 = 180°$

$n + 5n = 180°$

$\frac{6n}{6} = \frac{180}{6}$

$n = 30$

$30°$ and $150°$

The measure of an angle is twice the measure of its complement. Find the measure of each angle.

$\angle 1 + \angle 2 = 90°$

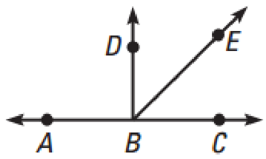
$x + 2x = 90$

$3x = 90$ $x = 30$

$2x = 60$

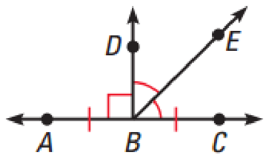
Interpreting a Diagram

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*.
- $\overleftrightarrow{AC}$, $\overrightarrow{BD}$, and $\overrightarrow{BE}$ 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.



HW: Pg 38 #'s 1-44