Name: _7th Period_

Two angles are **complementary angles** if the sum of their measure is 90°. Each angle is the **complement** of the other.

Two angles are **supplementary angles** if the sum of their measure is 180°. Each angle is the **supplement** of the other.

Two angles are **vertical angles** if their sides form two pairs of opposite rays.

Two adjacent angles are a **linear pair** if their noncommon sides are opposite rays.

Adjacent angles are two angles that share a common ray. They are next to each other.

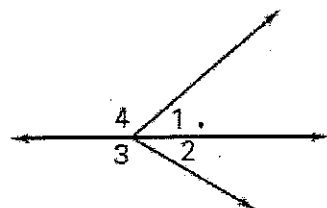**EXAMPLE 1** *Identifying Vertical Angles and Linear Pairs*

a. Are $\angle 1$ and $\angle 3$ vertical angles? _yes_

b. Are $\angle 2$ and $\angle 4$ a linear pair? _no_

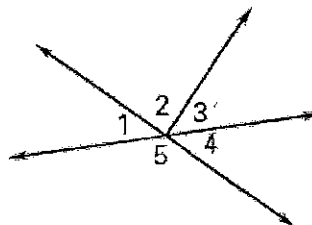c. Are $\angle 1$ and $\angle 4$ a linear pair? _yes_
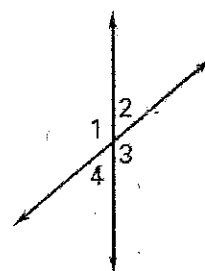
Exercises for Example 1

Use the figure to answer the questions.

1.

a. Are $\angle 1$ and $\angle 2$ a linear pair? _no_

b. Are $\angle 1$ and $\angle 3$ vertical angles? _no_

c. Are $\angle 1$ and $\angle 4$ a linear pair? _yes_
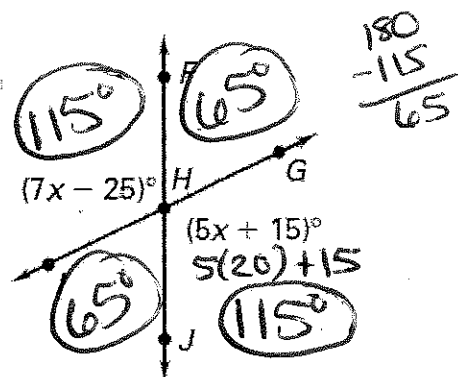
d. Are $\angle 2$ and $\angle 4$ vertical angles? _no_

2.

a. Are $\angle 1$ and $\angle 5$ a linear pair? _yes_

b. Are $\angle 1$ and $\angle 2$ a linear pair? _no_

c. Are $\angle 1$ and $\angle 4$ vertical angles? _yes_

d. Are $\angle 3$ and $\angle 5$ vertical angles? _no_

EXAMPLE 2 *Finding Angle Measures*

Solve for x in the diagram at the right.
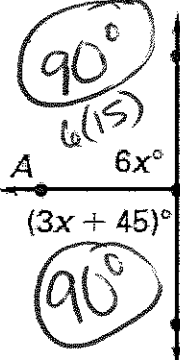Then find the angle measures.

$7x - 25 = 5x + 15$

$\begin{array}{r} 180 \\ -115 \\ \hline 65 \end{array}$

$(7x - 25)°$ $(5x + 15)°$ $5(20) + 15$

$115°$ $65°$ $65°$ $115°$

$7x - 25 = 5x + 15 \rightarrow \dfrac{2x}{2} = \dfrac{40}{2}$

$\begin{array}{r} -5x \qquad -5x \\ \hline 2x - 25 = 15 \\ +25 \quad +25 \end{array}$ $x = 20$
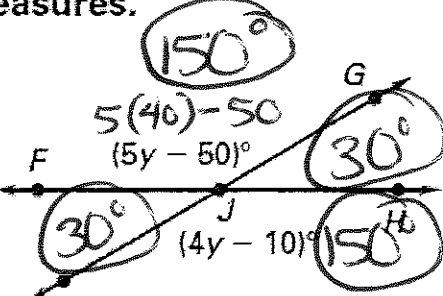
Exercises for Example 2

Solve for x and y, then find the angle measures.

3.
90° *B*
6(15) *90°*
A *6x°* *E* *C*
(3x + 45)° *90°*
90° *90°*
D

$6x + 3x + 45 = 180$
$9x + 45 = 180$
$\quad\quad -45 \quad -45$
$\dfrac{9x}{9} = \dfrac{135}{9}$
$x = 15$

4.
150° *G*
$5(40) - 50$
F $(5y - 50)°$ *30°*
30° *J*
$(4y - 10)°$ *50°* *H*
I

$5y - 50 = 4y - 10$
$\quad -4y \quad\quad -4y$
$y - 50 = -10$
$y + 50 \quad +50$
$y = 40$

EXAMPLE 3 Finding Measures of Complements and Supplements
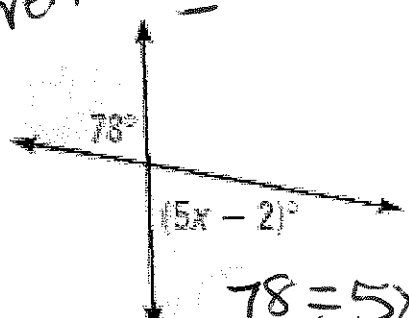
90°
a. Given that ∠E is a complement of ∠F and m∠E = 68°, find m∠F. $90 - 68 = 22°$

180°
b. Given that ∠G is a supplement of ∠H and m∠G = 152°, find m∠H. $180 - 152 = 28°$

Exercises for Example 3
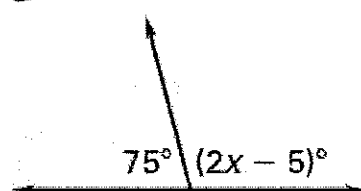
Find the measure of the angle.

5. Given that ∠A is a complement of ∠B and m∠B = 81°, find m∠A. $90 - 81 = 9°$

6. Given that ∠C is a supplement of ∠D and m∠C = 27°, find m∠D. $180 - 27 = 153°$

~~TOTD:~~ **Solve for x in each of the following:**

vertical =

LP supp = 180

7.
78°
(5x − 2)°

$78 = 5x - 2$
$+2 \quad\quad +2$
$\dfrac{80}{5} = \dfrac{5x}{5}$
$16 = x$

8.
$75° \quad (2x − 5)°$

$75 + 2x - 5 = 180$
$70 + 2x = 180$
$-70 \quad\quad -70$
$\dfrac{2x}{2} = \dfrac{110}{2}$
$x = 55$