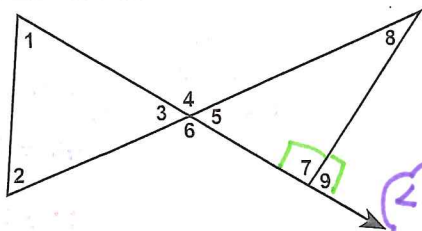
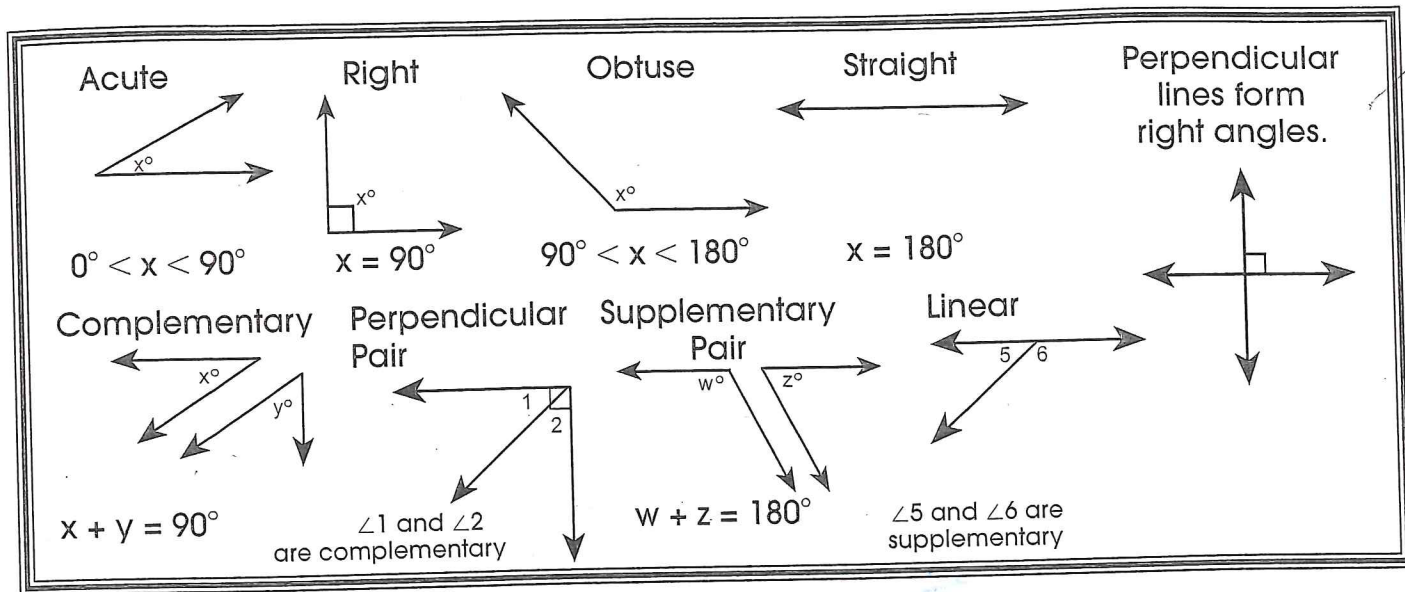


# Classifying Angles



In the figure,  $m\angle 7 = 90^\circ$

1. Name the angles which appear to be:

a. acute

b. obtuse

c. right

$\angle 1, \angle 2, \angle 3, \angle 5, \angle 8$

$\angle 4, \angle 6$

$\angle 7$  and  $\angle 9$

$\angle 3$  and  $\angle 4, \angle 5$  and  $\angle 6, \angle 4$  and  $\angle 5, \angle 6$  and  $\angle 3, \angle 7$  and  $\angle 9$

2. Name five pairs of supplementary angles.

3.  $\angle 7$  and  $\angle 9$  form a linear pair.

$\angle 10$  and  $\angle 11$  are complementary angles.

4.  $m\angle 10 = 32^\circ; m\angle 11 = \underline{58^\circ}$

5.  $m\angle 11 = 72^\circ; m\angle 10 = \underline{18^\circ}$

\*6.  $m\angle 10 = 4x; m\angle 11 = 2x; x = \underline{15}$

\*7.  $m\angle 10 = x; m\angle 11 = x + 20; x = \underline{35}$

$\angle 12$  and  $\angle 13$  are supplementary angles.

\*8.  $m\angle 12 = 2y; m\angle 13 = 3y - 15; y = \underline{39}$

\*9.  $m\angle 12 = y + 10; m\angle 13 = 3y + 10; y = \underline{40}$

\*10. The measure of  $\angle 12$  is five times the measure of  $\angle 13$ . Find the measure of each angle.

$\angle 12 = 150^\circ$   
 $\angle 13 = 30^\circ$  must have Both Angles!

$\angle 13$  and  $\angle 14$  are complementary angles, and  $\angle 14$  and  $\angle 15$  are supplementary angles.

11.  $m\angle 13 = 47^\circ; m\angle 14 = \underline{43^\circ}; m\angle 15 = \underline{137^\circ}$

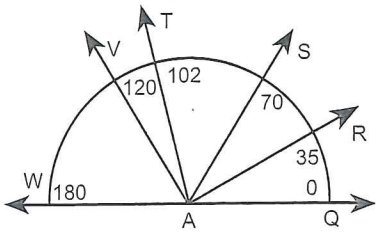
12.  $m\angle 14 = 78^\circ; m\angle 13 = \underline{12^\circ}; m\angle 15 = \underline{102^\circ}$

13.  $m\angle 15 = 135^\circ; m\angle 13 = \underline{45^\circ}; m\angle 14 = \underline{45^\circ}$

$\angle 13 + \angle 14 = 90^\circ$   
 $\angle 14 + \angle 15 = 180^\circ$   
use this for #11  $\rightarrow$  #13

work on attached paper must show work for credit!!

## Congruence of Angles and Addition Properties



**Angle Measures**

$m\angle QAT = 102 - 0 = 102$

$m\angle TAR = 102 - 35 = 67$

$m\angle WAV = 180 - 120 = 60$

**Congruence**

$m\angle SAR = 35, m\angle RAQ = 35$

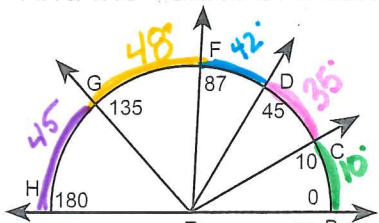
$\angle SAR \cong \angle RAQ$

**Angle Addition**

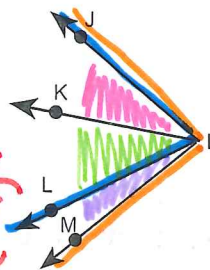
$m\angle VAT + m\angle TAS = m\angle VAS$

$18 + 32 = 50$

Find the values of each of the following.



1.  $m\angle CEB = 10^\circ$
2.  $m\angle FED = 42^\circ$
3.  $m\angle BEG = 135^\circ$
4.  $m\angle HEF = 93^\circ$
5.  $m\angle BEC + m\angle CEF = 10 + (35 + 42) = 87^\circ$
6.  $m\angle DEF + m\angle GEF = 42 + 48 = 90^\circ$
7.  $m\angle HEG + m\angle CED = 45 + 35 = 80^\circ$
8.  $m\angle GEB - m\angle DEB = 135 - 45 = 90^\circ$
9.  $m\angle GED + m\angle DEC = 90 + 35 = 125^\circ$
10.  $m\angle HEG + m\angle FEC = 45 + 77 = 122^\circ$
11.  $m\angle HEF - m\angle HEG = 93 - 45 = 48^\circ$
12.  $m\angle GED + m\angle DEC - m\angle FED = (48 + 42) + 35 - 42 = 83^\circ$
13.  $m\angle HEG + m\angle CEF - m\angle BEC = 45 + (42 + 35) - 10 = 112^\circ$
14.  $m\angle BEG - m\angle FED - m\angle BEC = 135 - 42 - 10 = 83^\circ$
15. Name a pair of congruent angles.  $\angle HEG \cong \angle DEB$  (Both  $45^\circ$ )



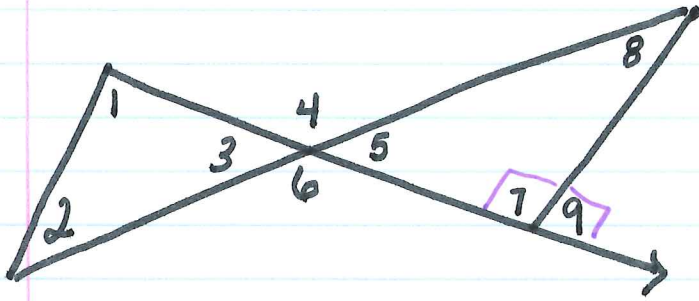
16. Name the angle with the greatest measure.  $\angle JIM$
17.  $m\angle JIK + m\angle KIL = \angle JIL$
18.  $m\angle MIL + m\angle LIJ = \angle JIM$
19.  $m\angle KIJ = 28$  &  $m\angle LIK = 39$ ;  $m\angle LIJ = 67^\circ$  needs work
20.  $m\angle MIJ = 81$  &  $m\angle MIL = 12$ ;  $m\angle LIJ = 69^\circ$  needs work

Find x.

21.  $m\angle KIL = 2x$ ;  $m\angle LIM = x$ ;  $m\angle KIM = 4x - 17$        $x = 17^\circ$  needs work
22.  $m\angle JIK = x$ ;  $m\angle KIL = 3x + 5$ ;  $m\angle JIL = 5x - 15$        $x = 20^\circ$  needs work.

**Class**  
#19 - #22  
must have  
work shown  
on separate  
sheet of lined  
paper. Don't  
lose the work  
if you don't bring  
it NO  
credit!

# Classifying Angles page 11



1.) Name the angles which appear to be:

a.) acute  
 $\angle 1, \angle 2, \angle 3, \angle 5$   
 $\angle 8$

b.) obtuse  
 $\angle 4, \angle 6$

c.) right  
 $\angle 7, \angle 9$

2.) 5 pairs of suppl.  $\angle$ s: ①  $\angle 3$  and  $\angle 4$

②  $\angle 4$  and  $\angle 5$  ③  $\angle 5$  and  $\angle 6$  ④  $\angle 6$  and  $\angle 3$

⑤  $\angle 7$  and  $\angle 9$

3.)  $\angle 7$  and  $\angle 9$  form a linear pair

4.)  $\angle 10$  and  $\angle 11$  are compl.  $\angle 10 + \angle 11 = 90^\circ$

$\angle 10 = 32^\circ$ ,  $m \angle 11 = \underline{58^\circ}$

$$32 + \angle 11 = 90$$

$$\angle 11 = 90 - 32$$

5.)  $\angle 11 = 72^\circ$ ,  $m \angle 10 = \underline{18^\circ}$

$$\angle 10 + 72 = 90$$

$$\angle 10 = 90 - 72$$

6.)  $\angle 10 = 4x$ ,  $\angle 11 = 2x$   $x = \underline{15}$

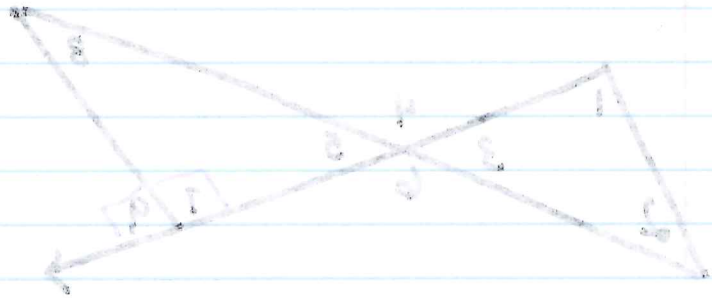
$$\angle 10 + \angle 11 = 90$$

$$4x + 2x = 90$$

$$6x = 90$$

$$\frac{6x}{6} = \frac{90}{6}$$

} must show work



1.) Name the angles which appear to be:

- a.) acute  $\angle 1, \angle 2, \angle 3, \angle 4$
- b.) obtuse  $\angle 1, \angle 2$
- c.) right  $\angle 3, \angle 4$

2.) 2 pairs of angles  $\angle 1$  &  $\angle 3$ ,  $\angle 2$  &  $\angle 4$   
 3.) 4 angles  $\angle 1, \angle 2, \angle 3, \angle 4$   
 4.) 2 angles  $\angle 1, \angle 3$  and  $\angle 2, \angle 4$

3.)  $\angle 1$  and  $\angle 3$  form a linear pair

adjacent  $\angle 1$  and  $\angle 3$   
 $\angle 1 + \angle 3 = 180^\circ$   
 $\angle 1 = 38^\circ$   
 $\angle 3 = 180 - 38 = 142^\circ$

$\angle 2$  and  $\angle 4$  are adjacent  
 $\angle 2 + \angle 4 = 180^\circ$   
 $\angle 2 = 115^\circ$   
 $\angle 4 = 180 - 115 = 65^\circ$

$\angle 1$  and  $\angle 2$  are adjacent  
 $\angle 1 + \angle 2 = 180^\circ$   
 $38 + 115 = 153 \neq 180$

adjacent angles  

$$\begin{cases} \angle 1 + \angle 3 = 180 \\ \angle 2 + \angle 4 = 180 \\ \angle 1 + \angle 2 = 180 \\ \angle 3 + \angle 4 = 180 \end{cases}$$

## classifying Angles pg 11 continued

7.)  $\angle 10 = x$  ,  $\angle 11 = x + 20$      $x = \underline{35}$

$$\begin{aligned}\angle 10 + \angle 11 &= 90 \\ x + x + 20 &= 90 \\ 2x + 20 &= 90 \\ \frac{2x}{2} &= \frac{70}{2}\end{aligned}$$

} must show work

$\angle 12$  and  $\angle 13$  are suppl.  $\angle$ s  
 $\angle 12 + \angle 13 = 180^\circ$  ←

8.  $\angle 12 = 2y$  ,  $\angle 13 = 3y - 15$      $y = \underline{39}$

$$\begin{aligned}2y + 3y - 15 &= 180 \\ 5y - 15 &= 180 \\ 5y &= 195 \\ y &= 39\end{aligned}$$

} must show work

9.  $\angle 12 = y + 10$  ,  $\angle 13 = 3y + 10$      $y = \underline{40}$

$$\begin{aligned}y + 10 + 3y + 10 &= 180 \\ 4y + 20 &= 180 \\ \frac{4y}{4} &= \frac{160}{4} \\ y &= 40\end{aligned}$$

} must show work

10.) The measure of  $\angle 12$  is 5 times the measure of  $\angle 13$ . Find the measure of Each angle.

$$\begin{aligned}\angle 12 &= 5 \angle 13 & \text{let } \angle 13 &= x \\ \angle 12 &= 5x & \text{Recall: } \angle 12 + \angle 13 &= 180 \\ & & 5x + x &= 180\end{aligned}$$

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

$$x = 30$$

$$\boxed{\angle 13 = 30^\circ}$$

and

$$\boxed{\angle 12 = 5(30)}$$

$$\boxed{\angle 12 = 150^\circ}$$

# 11 → # 13 work is on work sheet.

Classifying Angles pg 11 continued

1.)  $\angle 10 = x$ ,  $\angle 11 = x + 50$ ,  $x = 30$

$\left. \begin{aligned} \angle 10 + \angle 11 &= 90 \\ x + x + 50 &= 90 \\ 2x + 50 &= 90 \\ 2x &= 40 \\ x &= 20 \end{aligned} \right\} \text{ must show work}$

$\angle 12$  and  $\angle 13$  are supp.  $\angle 2$   
 $\angle 12 + \angle 13 = 180$

2.)  $\angle 12 = 3y - 12$ ,  $\angle 13 = 3y - 12$ ,  $y = 30$

$\left. \begin{aligned} 3y + 3y - 12 &= 180 \\ 6y - 12 &= 180 \\ 6y &= 192 \\ y &= 32 \end{aligned} \right\} \text{ must show work}$

3.)  $\angle 15 = y + 10$ ,  $\angle 16 = 3y + 10$ ,  $y = 40$

$\left. \begin{aligned} y + 10 + 3y + 10 &= 180 \\ 4y + 20 &= 180 \\ 4y &= 160 \\ y &= 40 \end{aligned} \right\} \text{ must show work}$

10.) The measure of  $\angle 15$  is 5 times the measure of  $\angle 13$ . Find the measure of  $\angle 13$ .

Each angle:  $\angle 13 = 5 < 13$   
 Given:  $\angle 15 + \angle 13 = 180$   
 $5x + x = 180$   
 $6x = 180$   
 $x = 30$   
 $\angle 13 = 5(30)$   
 $\angle 13 = 150$

# 11 + # 13 must show work.