

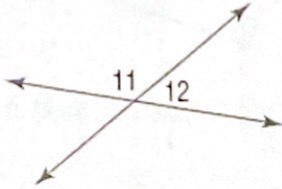
Key

Angle Relationships: Mixed Review Homework#2

Directions: Show your geometry and justifications and then solve.

1. Find  $m\angle 12$ .

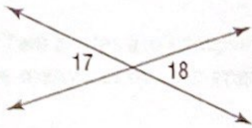
$$m\angle 11 = 4x,$$
$$m\angle 12 = 2x - 6$$



$\angle 11 + \angle 12 = 180$  linear pairs are suppl.  
 $4x + 2x - 6 = 180$   
 $6x - 6 = 180$   
 $x = 31$

2. Find  $m\angle 17$ .

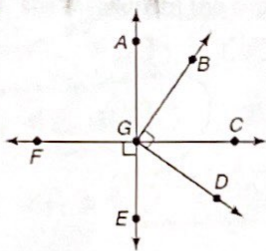
$$m\angle 17 = 2x + 7,$$
$$m\angle 18 = x + 30$$



$\angle 17 \cong \angle 18$  vertical  $\angle$ s are  $\cong$   
 $2x + 7 = x + 30$   
 $x = 23$

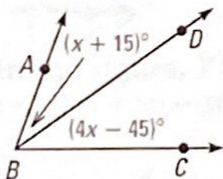
$m\angle 17 = 2(23) + 7$   
 $m\angle 17 = 53^\circ$

3. If  $m\angle BGC = 16x - 4$ ,  $m\angle CGD = 2x + 13$ ,  $\overline{BG} \perp \overline{GD}$ , find  $x$ .



$\angle BGD = 90^\circ$  def of  $\perp$   
 $\angle BGC + \angle CGD = \angle BGD$  angle addition  
 $16x - 4 + 2x + 13 = 90$   
 $18x + 9 = 90$   
 $18x = 81$   
 $x = 4.5$

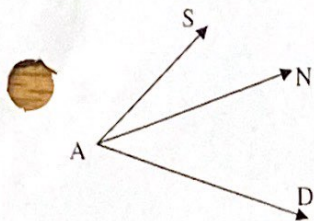
4.  $\overrightarrow{BD}$  bisects  $\angle ABC$ . Find the value of  $x$ .



$\angle ABD \cong \angle DBC$  def of  $\angle$  bisector  
 $x + 15 = 4x - 45$   
 $60 = 3x$   
 $20 = x$



5. Find  $x$  and the  $m\angle SAD$  if  $m\angle SAD = 16x - 2$ ,  $m\angle SAN = 9x - 7$ , and  $m\angle DAN = 3x + 17$ .



$\angle SAN + \angle DAN = \angle SAD$  angle addition

$9x - 7 + 3x + 17 = 16x - 2$

$12x + 10 = 16x - 2$

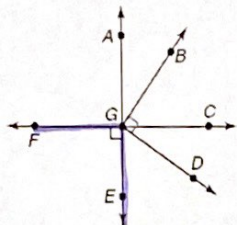
$12 = 4x$

$3 = x$

$m\angle SAD = 16(3) - 2$

$m\angle SAD = 46^\circ$

6. If  $m\angle FGE = 5x + 10$  and  $\overline{FC} \perp \overline{AE}$ , find  $x$ .



$m\angle FGE = 90^\circ$  def of  $\perp$

$5x + 10 = 90$

$5x = 80$

$x = 16$

7. Two angles are complementary. The measure of one angle is 21 more than twice the measure of the other angle. Find the measures of both angles.

$\angle A + \angle B = 90$  def of compl.

$\angle A = 2\angle B + 21$

$2\angle B + 21 + \angle B = 90$

$3\angle B + 21 = 90$

$3\angle B = 69$

$\angle B = 23^\circ$

$\angle A = 2(23) + 21$

$23^\circ, 67^\circ$

$\angle A = 67^\circ$

8. The measure of the supplement to  $\angle A$  is 60 less than three times the measure of the complement to  $\angle A$ .

$\angle A + \angle S = 180$  def of suppl.

$\angle S = 3\angle C - 60$

$\angle A + \angle C = 90$  def of compl.

$\angle A = 90 - \angle C$

$90 - \angle C + 3\angle C - 60 = 180$

$2\angle C + 30 = 180$

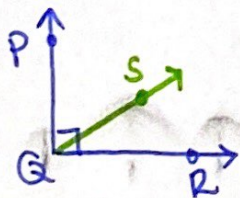
$2\angle C = 150$

$\angle C = 75$

$\angle S = 3(75) - 60$   
 $\angle S = 165$

$\angle A + 75 = 90$   
 $\angle A = 15$

9. Rays PQ and QR form a right angle. Point S lies in the interior of  $\angle PQR$ . If  $\angle PQR = 4 + 7a$  and  $\angle SQR = 9 + 4a$ , find the measures of  $\angle PQS$  and  $\angle SQR$ .



$\angle PQR = 90^\circ$  def of  $RT\angle$

$\angle PQS + \angle SQR = \angle PQR$  angle addition

$4 + 7a + 9 + 4a = 90$

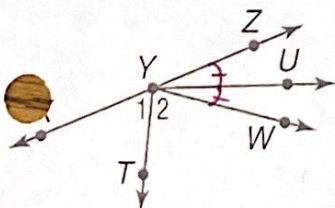
$13 + 11a = 90$

$a = 7$

$m\angle PQS = 53^\circ$

$m\angle SQR = 37^\circ$

10. In the figure,  $\overline{YX}$  and  $\overline{YZ}$  are opposite rays.  $\overline{YU}$  bisects  $\angle ZYW$ , and  $\overline{YT}$  bisects  $\angle XYW$ . If  $m\angle ZYU = 8p - 10$  and  $m\angle UYW = 10p - 20$ , find  $m\angle ZYU$ .



$\angle ZYU \cong \angle UYW$  def of angle bisector

$8p - 10 = 10p - 20$

$10 = 2p$

$5 = p$

$m\angle ZYU = 8(5) - 10$

$m\angle ZYU = 30^\circ$