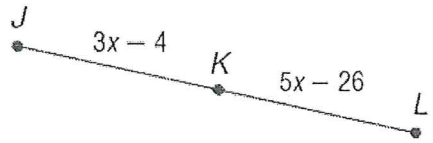
Name: _____ Date: _____ Hour: _____

Key to follow

Advanced Angle and Segment Relationships: Homework #2

Directions: Answer the following and describe the property(ies) you used in your logic.

1. Find x and the measure of $\overline{JK}$ if K is the midpoint of $\overline{JL}$. Show work.

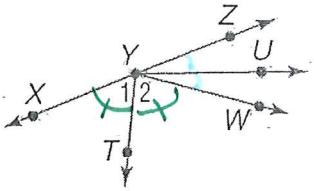


Find the value of the variable and QR if Q is between P and R. Justify steps!

2. $PQ = 1 - x, QR = 4x + 17, PR = -3x$

3. $PR = 7n + 8, PQ = 4n - 3, QR = 6n + 2$

In the figure, $\overrightarrow{YX}$ and $\overrightarrow{YZ}$ are opposite rays. $\overrightarrow{YU}$ bisects $< ZYW$, and $\overrightarrow{YT}$ bisects $< XYW$. Show your work. Justify steps!



4. If $m < ZYU = 8p - 10$ and $m < UYW = 10p - 20$, find $m < ZYU$.

5. If the $m < 1 = 5x + 10$ and the $m < 2 = 8x - 23$, find $m < 2$.

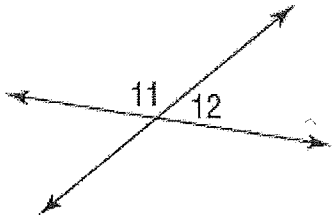
6. If $m < 1 = y$ and $m < XYW = 6y - 24$, find y.

7. if $m < WYZ = 82$ and $m < ZYU = 4r + 25$, find r.

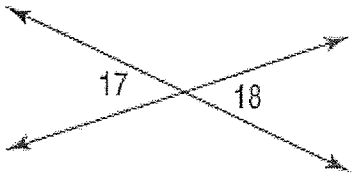
8. If $m < WYX = 2(12b + 7)$ and $m < ZYU = 9b - 1$, find $m < UYW$.

Find x <u>and</u> the measure of each angle.

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



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



Draw a picture of indicated situation, find the value of the variable and answer each question.

11. <ABC and <CBD are complementary. What does it mean to be complementary?

If $m < ABC = 6m + 8$ and $m < CBD = 3m + 10$, draw and label the figure and solve for m. Be sure to not use two of the same points (ex. You can't have two point Bs, they must share one B.)

12.<ABC and <CBD are supplementary. What does it mean to be supplementary?

If $m < ABC = 7n - 9$ and $m < CBD = 5n + 45$, draw and label the figure and solve for n. Be sure to not use two of the same points (ex. You can't have two point Bs, they must share one B.)

Key

Advanced

Angle + Segment Relationships HW #2

1.) $JK = KL$ def of midpt

$3x - 4 = 5x - 26$ substitution

$-4 = 2x - 26$ subtraction

$22 = 2x$ addition

$\boxed{11 = x}$ division

$JK = 3 \cdot 11 - 4$

$\boxed{JK = 29}$

2.) $PQ + QR = PR$ segment addition

$1 - x + 4x + 17 = -3x$ substitution

$3x + 18 = -3x$ CLT - substitution

$18 = -6x$ subtraction

$\boxed{-3 = x}$ division

$\boxed{QR = 5}$

3.) $PQ + QR = PR$ segment addition

$4n - 3 + 6n + 2 = 7n + 8$ substitution

$10n - 1 = 7n + 8$ CLT - substitution

$3n - 1 = 8$ subtraction

$3n = 9$ addition

$\boxed{n = 3}$ division

4.) $\angle ZYU = \angle UYW$ def of $\angle$ bisector

$8p - 10 = 10p - 20$ Substitution

$10 = 2p$ Subtraction + addition

$5 = p$ division

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

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

5.) $\angle 1 = \angle 2$ def of angle bisector

$5x + 10 = 8x - 23$ Substitution

$10 = 3x - 23$ Subt.

$33 = 3x$ add.

$11 = x$ div.

$m\angle 2 = 8(11) - 23$

$\boxed{m\angle 2 = 65^\circ}$

6.) $\angle 1 + \angle 2 = \angle XYW$ angle addition $\angle 1 = \angle 2$ def of $\angle$ bisector

$\angle 1 + \angle 1 = \angle XYW$ Substitution

$y + y = 6y - 24$ Substitution

$2y = 6y - 24$ CLT

$-4y = -24$ Subtraction

$\boxed{y = 6}$ division

7.) $\angle WYZ = 2\angle ZYU$ angle addition (double $\angle$) def of $\angle$ bisector

$82 = 2(4r + 25)$ Substitution

$82 = 8r + 50$ distribution

$32 = 8r$ subtraction

$\boxed{4 = r}$ division

8.) $\angle WYX + \angle ZYU = 180$ linear pairs are suppl.

$2(12b+7) + 2(9b-1) = 180$ substitution

$24b + 14 + 18b - 2 = 180$ distribution

$42b + 12 = 180$ CLT- substitution

$42b = 168$ subtraction

$b = 4$ division

$\angle UYW = \angle ZYU$

$\angle UYW = 9(4) - 1$

$\boxed{\angle UYW = 35^\circ}$

9.) $\angle 11 + \angle 12 = 180$. linear pairs are suppl.

$4x + 2x - 6 = 180$ subst.

$6x - 6 = 180$ CLT- subst.

$6x = 186$ addition

$\boxed{x = 31}$ division

$\boxed{\angle 11 = 124^\circ}$ $\boxed{\angle 12 = 56^\circ}$

10.) $\angle 17 \cong \angle 18$ vertical angles are $\cong$

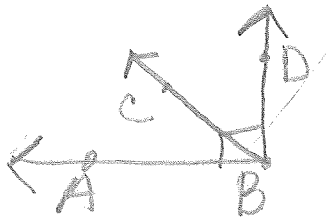
$2x + 7 = x + 30$ substitution

$x + 7 = 30$ subtraction

$\boxed{x = 23}$ subtraction

$\angle 17 = \angle 18 \boxed{= 53^\circ}$

11.)



compl. ⇒ adds to = 90°

$\angle ABC + \angle CBD = 90°$ def of compl.

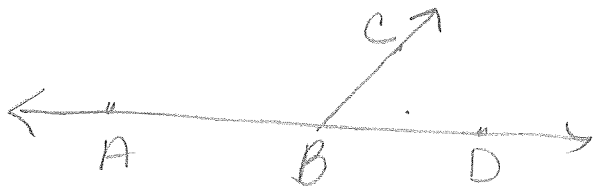
$6m+8+3m+10=90$ Substitution

$9m+18=90$ CLT - substitution

$9m=72$ subtraction

$\boxed{m=8}$ division

12.)



Suppl. means to add to equal 180°

$\angle ABC + \angle CBD = 180$ linear pair are suppl.

$7n-9+5n+45=180$ subst.

$12n+36=180$ CLT subst

$12n=144$ subtraction

$\boxed{n=12}$ division