

Alpha Honors Geometry, Glawe  
Q1 Midterm Review- Written Portion

Name: Key  
Date: \_\_\_\_\_ P: \_\_\_\_\_

Notes:

Complementary angles are two angles whose sum is  $90^\circ$  (a right angle). Each of the two angles is called the complement of the other.

Supplementary angles are two angles whose sum is  $180^\circ$  (a straight angle). Each of the two angles is called the supplement of the other.

ALSO MAKE SURE YOU STUDY ALGEBRA AS WELL IF YOU ARE STILL HAVING TROUBLE WITH THAT, ESPECIALLY FACTORING AND SIMPLIFYING RADICALS.

For questions 1 and 2, use the diagram on the right to help solve.

- 1)  $m\angle UOW = 50^\circ$ , and  $\overrightarrow{OV}$  bisects  $\angle UOW$ .  
What is  $m\angle VOY$ ?

$$m\angle VOY = 25 + 90 + 40 = \boxed{155}$$

- 2) What is  $m\angle UOX$ ?

$$m\angle UOX = 50 + 90 = \boxed{140}$$

For questions 3 and 4, draw a diagram to help solve.

- 3)  $\overrightarrow{BD}$  bisects  $\angle ABC$ ,  $m\angle ABC = (4x + 5)^\circ$ , and  $m\angle ABD = (3x - 1)^\circ$ .

What is the value of  $x$ ?

$$m\angle ABD \cong m\angle DBC$$

$$\frac{50}{50} m\angle OBC = (3x - 1)^\circ$$

$$m\angle PQS \cong m\angle SQR$$

$$SO m\angle SQR = (2x + 6)^\circ$$

For questions 5 and 6, find the value of the variable and the measure of each angle.

$$2(17) + 3.5 = 3(17) + 1.5 = 51 + 1.5 = 52.5$$

$$34 + 3.5 = 37.5$$

$$5a + 5 = 90$$

$$\frac{5a}{5} = \frac{85}{5} \quad \boxed{a=17}$$

$$90 - 52.5 = \boxed{37.5}$$

$$4x + 10y = 90$$

$$(11x + 5y = 90) - 2$$

$$4x + 10y = 90$$

$$-22x - 10y = -180$$

$$-18x = -90$$

$$\frac{-18x}{-18} = \frac{-90}{-18} \quad \boxed{x=5}$$

$$4(5) + 10y = 90$$

$$20 + 10y = 90$$

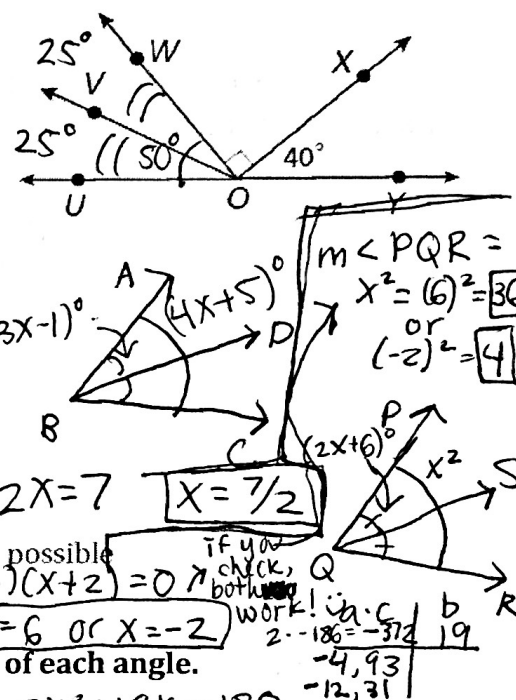
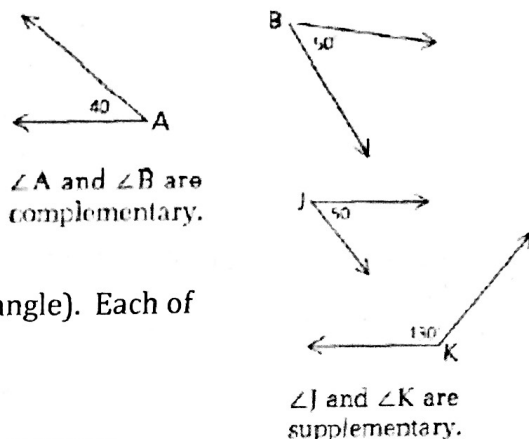
$$10y = 70$$

$$\frac{10y}{10} = \frac{70}{10} \quad \boxed{y=7}$$

$$4(5) + 10(7) = 90$$

$$20 + 70 = 90$$

$$90 = 90$$



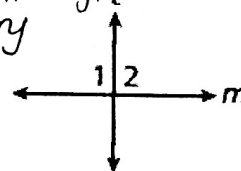
- 8) Given the following diagram, what can you assume? What can't you assume?

CAN assume:

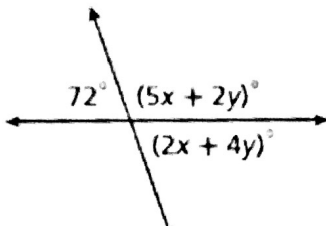
- line  $\ell$  and line  $m$  are straight angles
- $\angle 1$  and  $\angle 2$  are supplementary ( $m\angle 1 + m\angle 2 = 180$ )

CANNOT assume:

- $m\angle 1$  or  $m\angle 2 = 90$
- $\angle 1 \cong \angle 2$



For questions 9-12, solve for x and y.

9) 

$$\begin{aligned} 72 + 5x + 2y &= 180 \\ -72 & \quad -72 \\ \hline 5x + 2y &= 108 \end{aligned}$$

$$\begin{aligned} (5x + 2y = 108) - 3 \\ 5x + 2y + 2x + 4y &= 180 \\ 7x + 6y &= 180 \end{aligned}$$

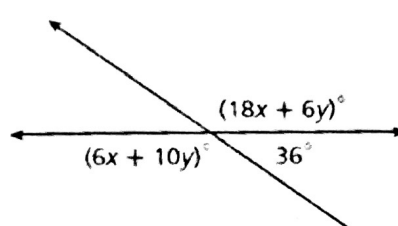
$$\begin{aligned} -15x - 6y &= -324 \\ +7x + 6y &= 180 \\ \hline -8x &= -144 \\ x &= 18 \end{aligned}$$

$$\begin{aligned} 5x + 2y &= 108 \\ 5(18) + 2y &= 108 \\ 90 + 2y &= 108 \\ 2y &= 18 \\ y &= 9 \end{aligned}$$

10) 

$$\begin{aligned} 3x + 3y - 3x + 17y &= 180 \\ 20y &= 180 \\ y &= 9 \end{aligned}$$

$$\begin{aligned} -3x + 17y + 45 &= 180 \\ -3x + 17(9) + 45 &= 180 \\ -3x + 198 &= 180 \\ -3x &= -18 \\ x &= 6 \end{aligned}$$

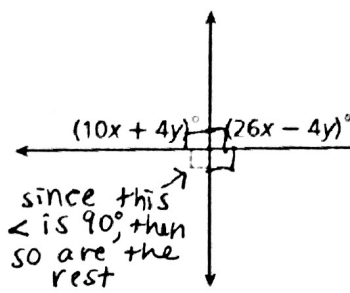
11) 

$$\begin{aligned} 6x + 10y + 36 &= 180 \\ -36 & \quad -36 \\ \hline 6x + 10y &= 144 \end{aligned}$$

$$\begin{aligned} (6x + 10y = 144) - 3 \\ 6x + 10y + 36 &= 180 \\ 18x + 6y + 36 &= 180 \\ 18x + 6y &= 144 \end{aligned}$$

$$\begin{aligned} -18x - 30y &= -432 \\ +18x + 6y &= 144 \\ \hline -24y &= -288 \\ y &= 12 \end{aligned}$$

$$\begin{aligned} 6x + 10y &= 144 \\ 6x + 10(12) &= 144 \\ 6x + 120 &= 144 \\ 6x &= 24 \\ x &= 4 \end{aligned}$$

12) 

since this is 90°, then so are the rest

$$\begin{aligned} 10x + 4y &= 90 \\ +26x - 4y &= 90 \\ \hline 36x &= 180 \\ x &= 5 \end{aligned}$$

$$\begin{aligned} 10x + 4y &= 90 \\ 10(5) + 4y &= 90 \\ 50 + 4y &= 90 \\ 4y &= 40 \\ y &= 10 \end{aligned}$$

For questions 13-16, find the measure of each angle.

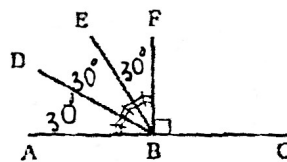
13) the supplement of  $\angle E J F$   $180^\circ - 62^\circ = 118^\circ$

15) the complement of  $\angle F J G$   $90^\circ - 65^\circ = 25^\circ$

14) the supplement of  $\angle G J H$   $180^\circ - 25^\circ = 155^\circ$

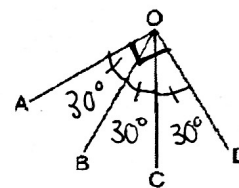
16) the supplement of  $\angle E J G$   $180^\circ - 62^\circ - 65^\circ = 53^\circ$

17) Find the measure of  $\angle DBC$ .



$$\angle DBC = 30^\circ + 30^\circ + 90^\circ = 150^\circ$$

18) If  $\overrightarrow{OB}$  and  $\overrightarrow{OC}$  trisect  $\angle AOD$  and  $AO \perp OD$ , find  $m\angle BOD$ .



$$m\angle BOD = 30 + 30 = 60$$

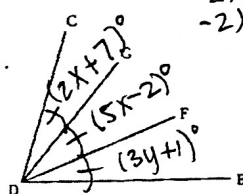
19)  $\overrightarrow{DG}$  and  $\overrightarrow{DF}$  trisect  $\angle CDE$ .

$$\begin{aligned} m\angle CDG &= 2x + 7 \\ m\angle GDF &= 5x - 2 \\ m\angle FDE &= 3y + 1 \end{aligned}$$

$$\begin{aligned} 5x - 2 &= 3y + 1 \\ 5(3) - 2 &= 3y + 1 \\ 15 - 2 &= 3y + 1 \\ 13 &= 3y + 1 \\ 12 &= 3y \\ y &= 4 \end{aligned}$$

First, solve for x.

Then solve for y.



$$\begin{aligned} 2x + 7 &= 5x - 2 \\ -2x & \quad -2x \\ \hline 7 &= 3x - 2 \\ +2 & \quad +2 \\ \hline 9 &= 3x \\ \frac{9}{3} &= \frac{3x}{3} \\ x &= 3 \end{aligned}$$

20) Given:  $\overleftrightarrow{AB} \perp \overleftrightarrow{BC}$

$\overleftrightarrow{BD}$  bis.  $\angle ABC$ .

$$m\angle ABD = x + 5y$$

$$m\angle DBC = 2x + 2y + 3$$

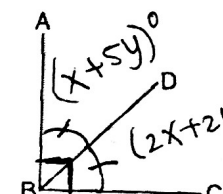
$$x = 3(6) - 3$$

$$x = 18 - 3$$

$$x = 15$$

Find x and y.

$$\begin{aligned} x + 5y &= 2x + 2y + 3 \\ -x & \quad -2y & \quad -x & \quad -2y \\ \hline 3y &= x + 3 \end{aligned}$$



$$\begin{aligned} 3y &= x + 3 \\ -3 & \quad -3 \\ \hline x + 5y + 2x + 2y + 3 &= 90 \\ 3x + 7y &= 87 \\ 3(3y - 3) + 7y &= 87 \\ 9y - 9 + 7y &= 87 \\ 16y &= 96 \\ y &= 6 \end{aligned}$$