

Name: \_\_\_\_\_

**KEY**

Date: \_\_\_\_\_

Block: \_\_\_\_\_

**ADVANCED GEOMETRY CHAPTER 3 REVIEW**

BE SURE TO:

\*Read the directions carefully and answer what the question is asking

\*If you get stuck, look back to the section in your notes the problem comes from. This is probably a hint that you should spend more time studying this section.

1. Name the following:

a. A segment parallel to AB



b. A segment perpendicular to DH

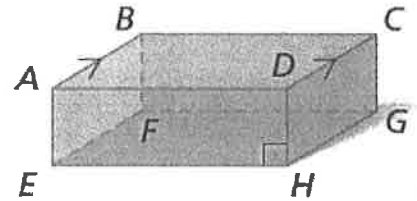


c. A line skew to AE that goes through point B



d. A plane parallel to Plane ABC

Plane EFG



Write the equation of the line in slope-intercept form passing through the given points:

2)  $(-2, -3)$  and  $(-4, 3)$

$$\begin{array}{l} (-2, -3) \\ (-4, 3) \end{array} \downarrow +6$$

$$m = -3 \quad (-4, 3)$$

$$y = mx + b$$

$$3 = -3(-4) + b$$

$$3 = 12 + b$$

$$-9 = b$$

$$y = -3x - 9$$

3)  $(-5, -5)$  and  $(-3, -1)$

$$\begin{array}{l} (-5, -5) \\ (-3, -1) \end{array} \downarrow +4$$

$$y = mx + b \quad m = 2 \quad (-5, -5)$$

$$-5 = 2(-5) + b$$

$$-5 = -10 + b$$

$$5 = b$$

$$m = \frac{4}{2} = 2$$

$$y = 2x + 5$$

Write the equation of the line based on the information provided below:

4) parallel to  $y = -\frac{7}{3}x + 3$ ; through  $(-3, -1)$

slope =  $-\frac{7}{3}$

$$y = mx + b$$

$$-1 = -\frac{7}{3}(-3) + b$$

$$-1 = 7 + b$$

$$-7 = b$$

$$-8 = b$$

$$y = -\frac{7}{3}x - 8$$

5) perp. to  $y = \frac{1}{2}x + 2$ ; through  $(-3, -7)$

our slope =  $-2$

$$y = mx + b$$

$$-7 = -2(-3) + b$$

$$-7 = 6 + b$$

$$-13 = b$$

$$y = -2x - 13$$

6) parallel to  $y = \frac{2}{5}x + 3$ ; through (3, 7)

$$m = \frac{2}{5} \quad (3, 7) \quad y = mx + b$$

$$7 = \frac{2}{5}(3) + b$$

$$5(7 = \frac{6}{5} + b)$$

$$35 = 6 + 5b$$

$$29 = 5b$$

$$\frac{29}{5} = b$$

$$y = \frac{2}{5}x + \frac{29}{5}$$

7) perp. to  $y = -3x - 5$ ; through (5, -2)

$$m = \frac{1}{3} \quad (5, -2)$$

$$y = mx + b$$

$$-2 = \frac{1}{3}(5) + b$$

$$3(-2 = \frac{5}{3} + b)$$

$$-6 = 5 + 3b$$

$$-11 = 3b$$

$$-\frac{11}{3} = b$$

$$y = \frac{1}{3}x - \frac{11}{3}$$

Write the equation of the perpendicular bisector of segment AB:

8) A(-2, -3), B(-4, 3)

$$\frac{(-2, -3) + (-4, 3)}{2}$$

$$\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}$$

$$m = \frac{6}{-2} = -3$$

$$\left(\frac{-2 + (-4)}{2}, \frac{-3 + 3}{2}\right)$$

$$y = mx + b$$

$$0 = \frac{1}{3}(-3) + b$$

$$0 = -1 + b$$

$$1 = b$$

$$\perp m = \frac{1}{3}$$

$$(-3, 0)$$

$$y = \frac{1}{3}x + 1$$

9) A(5, 3), B(-7, 7)

$$\frac{(5, 3) + (-7, 7)}{2}$$

$$m = \frac{4}{-12} = -\frac{1}{3}$$

$$\perp m = 3$$

midpt:

$$\left(-\frac{2}{2}, \frac{10}{2}\right)$$

$$(-1, 5)$$

$$y = mx + b$$

$$5 = 3(-1) + b$$

$$5 = -3 + b$$

$$8 = b$$

$$y = 3x + 8$$

Find the coordinates of point Q along the directed line segment LM so that LQ to QM is the given ratio.

10) L(-1, -2), M(3, 6); ratio 5 to 3  $t = \frac{5}{8}$

$$x = x_1 + t(x_2 - x_1)$$

$$y = y_1 + t(y_2 - y_1)$$

$$x = -1 + \frac{5}{8}(3 - (-1))$$

$$y = -2 + \frac{5}{8}(6 - (-2))$$

$$x = -1 + \frac{5}{8}(4)$$

$$y = -2 + \frac{5}{8}(8) \quad \left(\frac{3}{2}, 3\right)$$

$$x = -\frac{2}{2} + \frac{5}{2} = \frac{3}{2}$$

$$y = -2 + 5 = 3$$

11) L(2, 7), M(-1, 1); ratio 2 to 1  $t = \frac{2}{3}$

$$x = 2 + \frac{2}{3}(-1 - 2)$$

$$y = 7 + \frac{2}{3}(1 - 7)$$

$$= 2 + \frac{2}{3}(-3)$$

$$= 7 + \frac{2}{3}(-6)$$

$$= 2 - 2$$

$$= 7 - 4$$

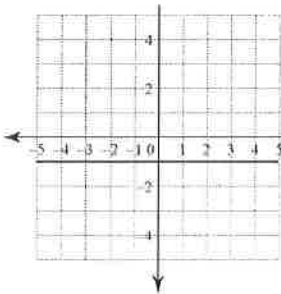
$$= 0$$

$$= 3$$

$$(0, 3)$$

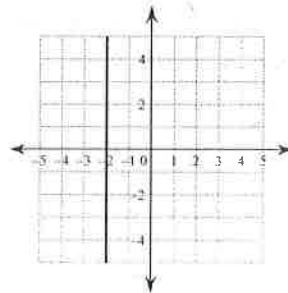
Write the equation of each line. (HOY-VUX)

12.



$$y = -1$$

13.



$$x = -2$$

14. A vertical line through (2, -5)

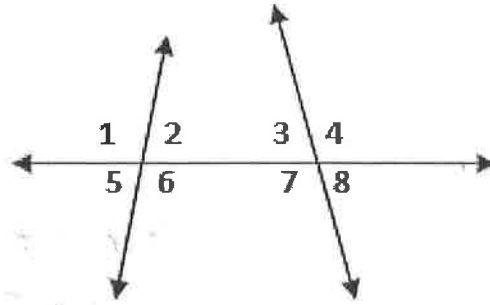
$$x = 2$$

15. A horizontal line through (4, -2)

$$y = -2$$

16-22. Match the correct angle pair with the given set of angles.

- A. Alternate Interior
- B. Consecutive Interior
- C. Alternate Exterior
- D. Corresponding
- E. Vertical
- F. Linear Pair
- G. No Relationship



- 16.  $\angle 1, \angle 8$  C
- 17.  $\angle 3, \angle 6$  A
- 18.  $\angle 3, \angle 7$  F
- 19.  $\angle 1, \angle 6$  E
- 20.  $\angle 5, \angle 8$  G
- 21.  $\angle 2, \angle 4$  D
- 22.  $\angle 6, \angle 7$  B

Use the figure to the right to answer #23-25

23. If R and S are parallel lines and  $\angle 1 = 4x - 3$  and  $\angle 7 = 3x + 4$ ,  
find the measure of  $\angle 2$ .

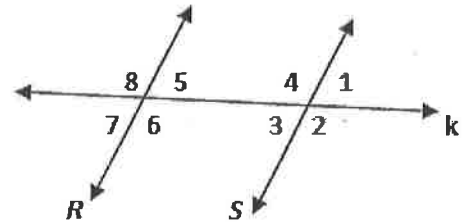
$$4x - 3 = 3x + 4$$

$$-3x + 3 - 3x + 3$$

$$x = 7$$

$$m\angle 1 = 4(7) - 3 = 25^\circ$$

$$m\angle 2 = 180 - 25 = 155^\circ$$



24. If R and S are parallel lines and  $\angle 3 = 2x + 15$  and  $\angle 5 = 5x + 3$ ,

find the measure of  $\angle 2$ .

$$2x + 15 = 5x + 3$$

$$-2x - 3 - 2x - 3$$

$$\frac{12}{3} = \frac{3x}{3}$$

$$4 = x$$

$$m\angle 3 = 2(4) + 15 = 23^\circ$$

$$m\angle 2 = 180 - 23^\circ = 157^\circ$$

25. If R and S are parallel lines and  $\angle 5 = 3x + 30$  and  $\angle 4 = 5x + 22$ ,

find the measure of  $\angle 2$ .

$$3x + 30 + 5x + 22 = 180$$

$$8x + 52 = 180$$

$$8x = 128$$

$$x = 16$$

$$m\angle 4 = 5(16) + 22 = 102^\circ$$

$$m\angle 2 = 102^\circ$$

Find the value of all missing variables.

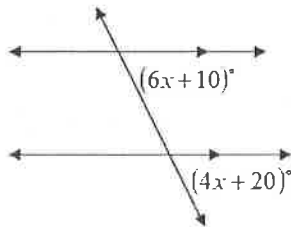
26.

$$6x + 10 = 4x + 20$$

$$2x + 10 = 20$$

$$2x = 10$$

$$x = 5$$

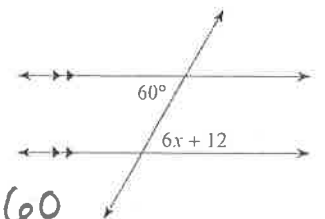


27.

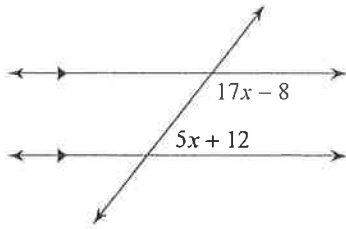
$$6x + 12 = 60$$

$$6x = 48$$

$$x = 8$$



28.



$$17x - 8 + 5x + 12 = 180$$

$$22x + 4 = 180$$

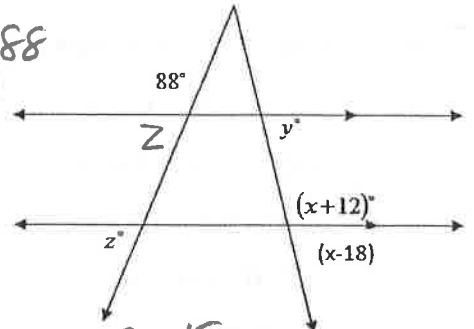
$$22x = 176$$

$$x = 8$$

29.

$$z = 180 - 88$$

$$z = 92^\circ$$



$$x + 12 + x - 18 = 180$$

$$2x - 6 = 180$$

$$2x = 186$$

$$x = 93$$

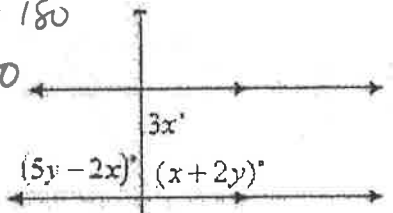
$$y = x - 18$$

$$y = 93 - 18$$

$$y = 75^\circ$$

30.  $3x + x + 2y = 180$

$$4x + 2y = 180$$

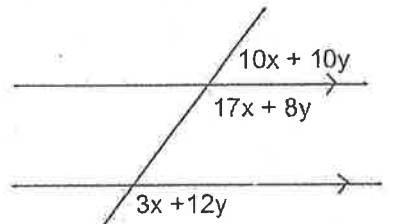


31.

$$5y - 2x + x + 2y = 180$$

$$7y - x = 180$$

$$-x + 7y = 180$$



$$10x + 10y + 17x + 8y = 180$$

$$17x + 8y = 3x + 12y$$

$$14x - 4y = 0$$

$$\frac{1}{4}(27x + 18y = 180)$$

$$\frac{1}{2}(14x - 4y = 0)$$

$$3x + 2y = 20$$

$$7x - 2y = 0$$

$$10x = 20$$

$$x = 2$$

$$14(2) - 4y = 0$$

$$28 - 4y = 0$$

$$-4y = -28$$

$$y = 7$$

$$4x + 2y = 180$$

$$4(-x + 7y = 180) \rightarrow -4x + 28y = 720$$

$$4x + 2y = 180$$

$$-4x + 28y = 720$$

$$\frac{30y = 900}{30 \quad 30}$$

$$y = 30$$

$$4x + 2(30) = 180$$

$$4x + 60 = 180$$

$$4x = 120$$

$$x = 30$$

32. Find the distance from P(4, 8) to the line  $6 = y + 2x$ .

$$(4, 8) \quad m = \frac{1}{2}$$

$$y = \frac{1}{2}x + 6$$

$$y = -2x + 6$$

$$\perp m = \frac{1}{2}$$

$$y = mx + b$$

$$8 = \frac{1}{2}(4) + b$$

$$\frac{1}{2}x + 6 = -2x + 6$$

$$8 = 2 + b$$

$$\frac{1}{2}x = -2x$$

$$6 = b$$

$$2\frac{1}{2}x = 0$$

$$x = 0$$

$$y = -2(0) + 6$$

$$y = 6$$

distance from (4, 8) to (0, 6)

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(0 - 4)^2 + (6 - 8)^2}$$

$$= \sqrt{(-4)^2 + (-2)^2}$$

$$= \sqrt{16 + 4} = \sqrt{20}$$

$$= 2\sqrt{5}$$

33. Find the distance from P(-2, 1) to  $y = \frac{1}{4}x - 3$ .

$$\perp m = -4 \quad (-2, 1)$$

$$-4x - 7 = \frac{1}{4}x - 3$$

$$y = mx + b$$

$$1 = -4(-2) + b$$

$$4(-4x = \frac{1}{4}x + 4)$$

$$1 = 8 + b$$

$$-7 = b$$

$$y = -4x - 7$$

$$-16x = x + 16$$

$$-17x = 16$$

$$x = \frac{16}{-17} \approx -0.94$$

$$(-2, 1) \quad (0.94, -10.76)$$

$$d = \sqrt{(0.94 + 2)^2 + (-10.76 - 1)^2}$$

$$d = \sqrt{(2.94)^2 + (-11.76)^2}$$

$$d = 12.12$$

$$y = -4(0.94) - 7$$

$$y = -10.76$$