Name: _____Key_____

Date: _____ Period: _____

Use the diagram below to answer questions #1 – 5.

1) Give two other names for $\overleftrightarrow{XY}$.

$\overleftrightarrow{YX}, \overleftrightarrow{YZ}, \overleftrightarrow{ZY}, \overleftrightarrow{XZ}, \overleftrightarrow{ZX},$ line g

2) Name three points that are collinear.

X, Y, Z

3) Name four points that are coplanar.

X, Y, N, Z

4) Name a pair of opposite rays.

$\overrightarrow{YX}, \overrightarrow{YZ}$

5) Name the intersection of line h and plane M.

Point Y
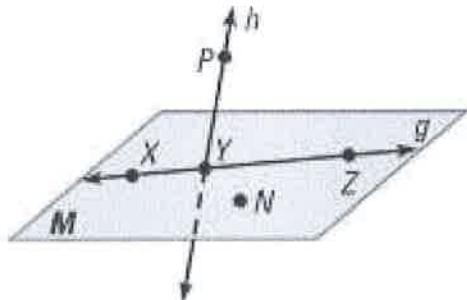
Use the points $A(4, -3), B(1, 1), C(-1, 2),$ and $D(3, 5)$ for questions #6 – 9.

6) What is the midpoint of $\overline{AB}$? $A \overset{x_1 \, y_1}{(4,-3)} \quad B \overset{x_2 \, y_2}{(1,1)}$

$M = \left(\dfrac{4+1}{2}, \dfrac{-3+1}{2}\right) = \left(\dfrac{5}{2}, \dfrac{-2}{2}\right) = \boxed{(2.5, -1)}$

7) What is the midpoint of $\overline{BC}$? $B \overset{x_1 \, y_1}{(1,1)} \quad C \overset{x_2 \, y_2}{(-1,2)}$

$M = \left(\dfrac{1+-1}{2}, \dfrac{1+2}{2}\right) = \left(\dfrac{0}{2}, \dfrac{3}{2}\right) = \boxed{(0, 1.5)}$

8) C is the midpoint of $\overline{AE}$. Find the coordinates of the **other** endpoint E.

Pattern from A to C: Left 5, up 5

from C to E : $\boxed{\text{Endpoint } (-6, 7)}$
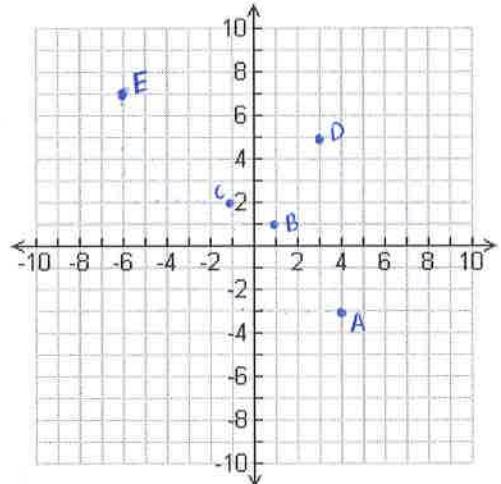
9) Please find $\overline{AD}$ ← distance from A to D. Round to the nearest tenth. $A \overset{x_1 \, y_1}{(4,-3)} \quad D \overset{x_2 \, y_2}{(3,5)}$

$AD = \sqrt{(3-4)^2 + (5--3)^2}$

$= \sqrt{(-1)^2 + (5+3)^2}$

$= \sqrt{1 + (8)^2}$

$= \sqrt{1 + 64}$

$= \sqrt{65} \approx \boxed{8.1}$

10) a. Find AC

$$\overset{\longleftarrow 4x+4 \longrightarrow}{A \quad 14 \quad B \quad 3x-4 \quad C}$$

$14+3x-4 = 4x+4$

$3x+10 = 4x+4$

$\quad -3x \qquad -3x$

$\overline{\quad 10 = x+4 \quad}$

$\quad -4 \quad -4$

$\boxed{6=x}$
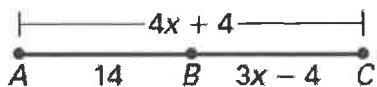
$AC = 4(6)+4$

$AC = 24+4$

$\boxed{AC=28}$

b. Find HJ

$$\overset{\longleftarrow \quad 129 \quad \longrightarrow}{H \quad 6x-5 \quad J \quad 4x-6 \quad K}$$
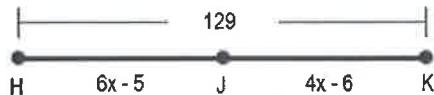
$6x-5+4x-6 = 129$

$10x-11 = 129$

$\quad +11 \quad +11$

$\dfrac{10x}{10} = \dfrac{140}{10}$

$\boxed{x=14}$

$HJ = 6(14)-5$

$HJ = 84-5$

$\boxed{HJ=79}$

---

11) Using the diagram below, is $\overline{AB} \cong \overline{CD}$? Show your work.

$x_1\,y_1 \qquad x_2\,y_2$
$A(-2,3) \quad B(4,2)$

$x_1\,y_1 \qquad\qquad x_2\,y_2$
$C(2,0) \qquad D(-3,-4)$

$AB = \sqrt{(4--2)^2 + (2-3)^2}$

$= \sqrt{(4+2)^2 + (-1)^2}$

$= \sqrt{(6)^2 + (-1)^2}$

$= \sqrt{36+1}$

$= \sqrt{37}$

$\boxed{AB \approx 6.1}$

$CD = \sqrt{(-3-2)^2 + (-4-0)^2}$

$= \sqrt{(-5)^2 + (-4)^2}$

$= \sqrt{25+16}$

$= \sqrt{41}$

$\boxed{CD \approx 6.4}$

$\overline{AB} \not\cong \overline{CD}$ because they are not the same length

12) Please sketch the following:

a. A line that that is in the plane.
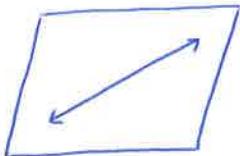


b. A plane and a line that does not intersect the plane.
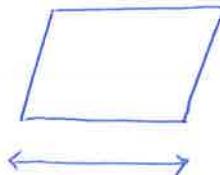
c. A line that intersects a plane at one point.
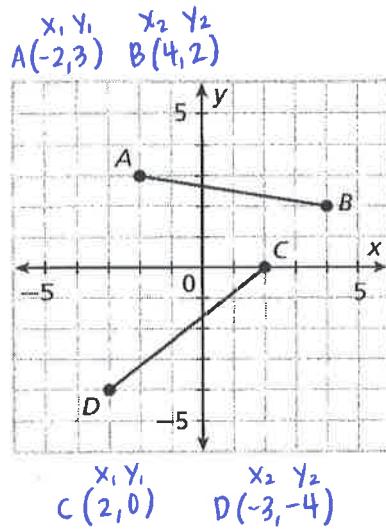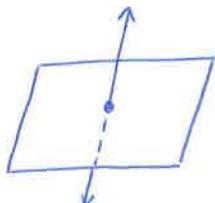
13) Point B is between A and C on $\overline{AC}$. $AB = x+3$, $BC = 2x+1$, and $AC = 10$. Please solve for x and find AB and BC. (Note : figure is not drawn to scale)
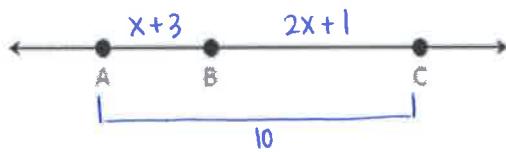
$$X+3+2X+1 = 10$$
$$3X+4 = 10$$
$$\underline{-4 \quad -4}$$
$$\frac{3X}{3} = \frac{6}{3}$$
$$\boxed{X=2}$$

$$AB = 2+3$$
$$\boxed{AB = 5}$$

$$BC = 2(2)+1$$
$$\boxed{BC = 5}$$

14) Using the diagram below, give two **different** examples of each of the following:

a. A segment

$\overline{JH}, \overline{HG}, \overline{FG}, \overline{GK}$

b. A ray

$\overrightarrow{JH}, \overrightarrow{HJ}, \overrightarrow{HG}, \overrightarrow{GH}, \overrightarrow{FK}, \overrightarrow{GK}$

c. A line

$\overleftrightarrow{JH}, \overleftrightarrow{HG}, \overleftrightarrow{HJ}, \overleftrightarrow{GH}$, line m
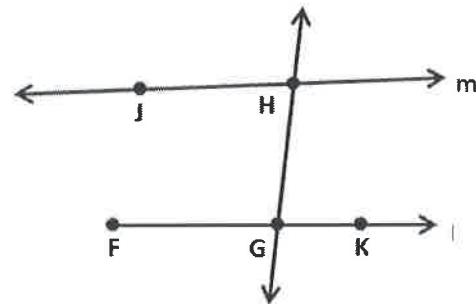
In the diagrams below, M is the midpoint of the segment.

15) a. Find LN.
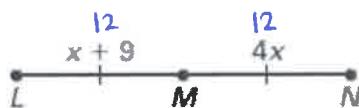
$$\frac{x+9 = 4x}{-x \quad -x}$$
$$\frac{9 = 3x}{3 \quad 3}$$
$$\boxed{3 = X}$$

$$LM = 3+9$$
$$= 12$$

$$LN = 12+12$$
$$\boxed{LN = 24}$$
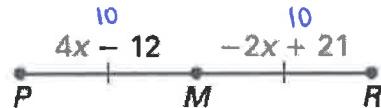
b. Find PR.

$$4x-12 = -2x+21$$
$$\underline{+2x \qquad +2x}$$
$$6x-12 = 21$$
$$\underline{+12 \quad +12}$$
$$\frac{6x}{6} = \frac{33}{6}$$
$$\boxed{X = 5.5}$$

$$PM = 4(5.5)-12$$
$$= 10$$

$$PR = 10+10$$
$$\boxed{PR = 20}$$

16) The map at the right is a map of places that Lizzie goes frequently. Coordinates are given in miles. The locations that Lizzie visits are:

Home (0,0), Dunkin Donuts (6,3), NHS (7,5), and Library (-2, 4).
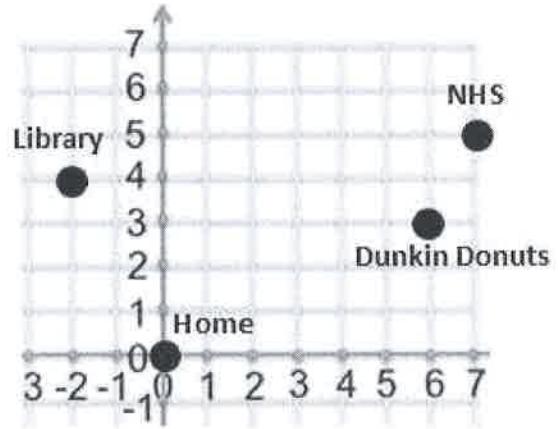
a. How far is it from Lizzie's house to Dunkin Donuts to the nearest tenth?

$$\overset{x_1\,y_1}{(0,0)} \to \overset{x_2\,y_2}{(6,3)}$$

$$D = \sqrt{(6-0)^2 + (3-0)^2}$$

$$= \sqrt{(6)^2 + (3)^2}$$

$$= \sqrt{36+9}$$

$$= \sqrt{45} \approx \boxed{6.7 \text{ miles}}$$

b. If Lizzie wanted to drive from NHS to the Library and make it back to school before the end of the school day, how far would she have to travel in **TOTAL** to the nearest tenth?

$$\overset{x_1\,y_1}{(7,5)} \to \overset{x_2\,y_2}{(-2,4)}$$

$$D = \sqrt{(-2-7)^2 + (4-5)^2}$$

$$= \sqrt{(-9)^2 + (-1)^2}$$

$$= \sqrt{81+1}$$

$$= \sqrt{82} \approx 9.1 \text{ miles}$$

NHS → Library : 9.1 miles
+
Library → NHS : 9.1 miles

Total $\boxed{18.2 \text{ miles}}$

Answer Key :

1) $\overleftrightarrow{YX}, \overleftrightarrow{YZ}, \overleftrightarrow{ZY}, \overleftrightarrow{XZ}, \overleftrightarrow{ZX}$, line g ✓

2) X, Y, Z ✓

3) X, Y, N, Z ✓

4) $\overrightarrow{YZ}$ and $\overrightarrow{YX}$ ✓

5) Point Y ✓

6) (2.5 , -1) ✓

7) (0, 1.5) ✓

8) E(-6 , 7) ✓

9) 8.1 ✓

10) a. 28 ✓   b. 79 ✓

11) $AB \approx 6.1,\ CD \approx 6.4$; Not congruent because they are not the same length. ✓
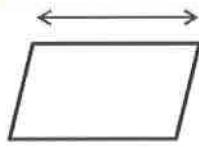
12) a. ✓   b. ✓   c. ✓
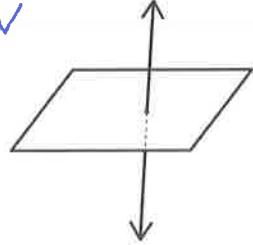
13) $x = 2,\ AB = 5,\ BC = 5$ ✓

14) a. $\overline{JH}, \overline{HG}, \overline{GF}, \overline{KG}$ ✓   b. $\overrightarrow{HJ}, \overrightarrow{FG}, \overrightarrow{FK}, \overrightarrow{GK}, \overrightarrow{HG}$ ✓   c. $\overleftrightarrow{JH}, \overleftrightarrow{HJ}, \overleftrightarrow{HG}, \overleftrightarrow{GH}$, line m ✓

15) a. 24 ✓   b. 20 ✓   16) a. 6.7 miles ✓   b. 18.2 miles ✓