Name: Key **Period:**_____

Unit 8 Review

For each pair of points find (a) the distance between the two points, (b) the midpoint of the segment that joins the two points, and (c) the slope of the segment that joins the two points.

1. (5, 1) and (3, 1)

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

$\frac{5+3}{2}$ $\frac{1+1}{2}$

$\frac{1-1}{5-3}$

1a. 2

1b. (4, 1)

1c. 0

2. (8, -6) and (0, 0)

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

$\sqrt{64+36}$

2a. 10

2b. (4, -3)

2c. $-\frac{3}{4}$

3. (-2, 7) and (8, -3)

$\sqrt{(8+2)^2+(-3-7)^2}$

$\sqrt{100+100}$

$\frac{-10}{10}$

3a. 14.14

3b. (3, 2)

3c. -1

Given P(3, -2) and Q(5, 2), find: $\frac{4}{2}$

4. the slope of any line parallel to $\overleftrightarrow{PQ}$. 4. 2

5. the slope of any line perpendicular to $\overleftrightarrow{PQ}$. 5. $-\frac{1}{2}$

Given A(-4, -1) and B(3, 5), find: $\frac{6}{7}$

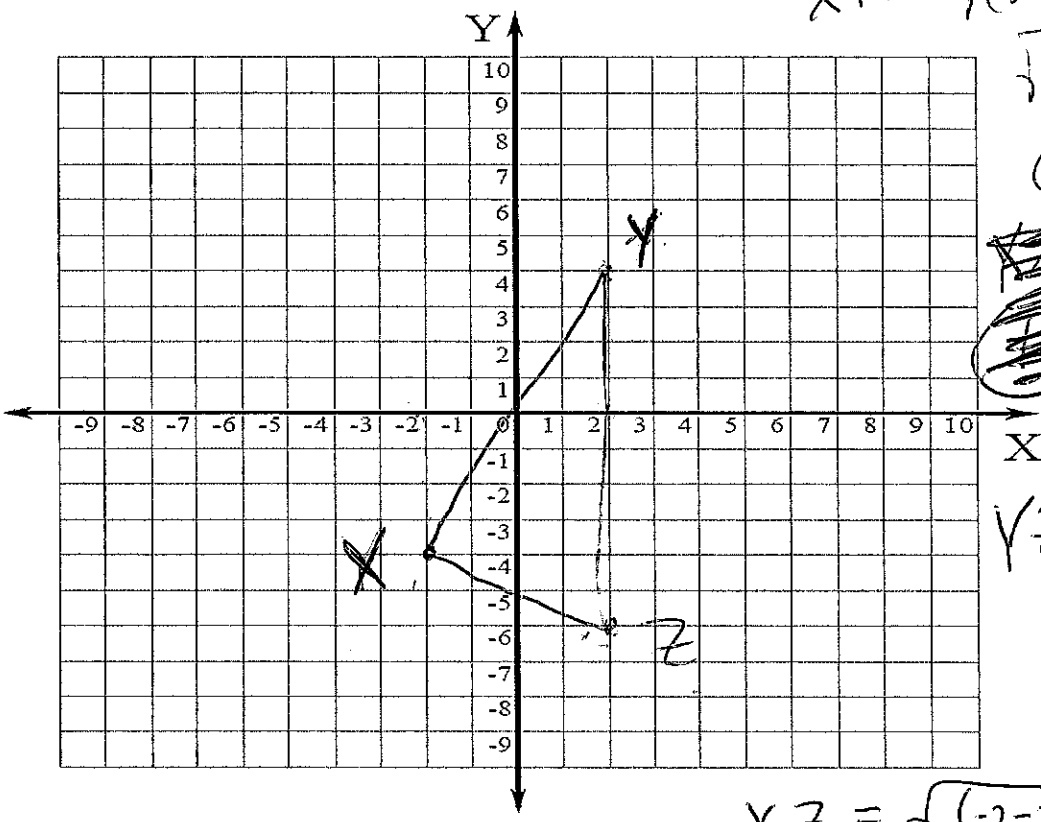
6. the slope of any line parallel to $\overleftrightarrow{AB}$. 6. $\frac{6}{7}$

7. the slope of any line perpendicular to $\overleftrightarrow{AB}$. 7. $-\frac{7}{6}$

8. For which is slope not defined, a horizontal or vertical line?

8. Vertical line

9. Graph X(-2, -4), Y(2, 4), and Z(2, -6), then find XY, YZ, and XZ.



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

$\sqrt{16+64}$

8.9

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

$\sqrt{100}$

10

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

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

$\approx$ 4.47

10. A line with slope $\frac{2}{3}$ passes through (9, -13) and (0, -19).

$-13 = \frac{2}{3}(9) + b$

$-13 = 6 + b$

$b = -19$

11. A line through (0, -2) has slope 5. Find three other points on the line.

$-2 = 5(0) + b$

$b = -2$

$y = 5x - 2$

x	y
1	3
2	8
3	13

12. Are the points A(0, 3), B(-2, 1), and C(3, 6) collinear? If so, which point lies between the other two.

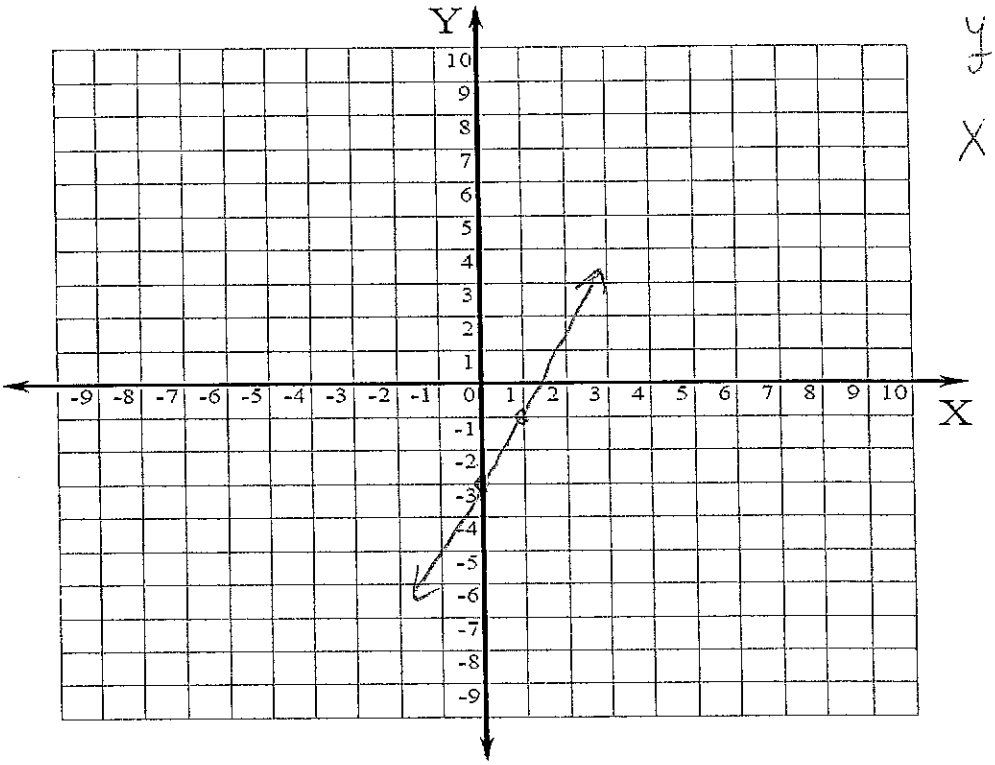
$m = \frac{-2}{-2} = 1$

$y = 1x + 3$

x	y
-2	1
3	6

✓ yes

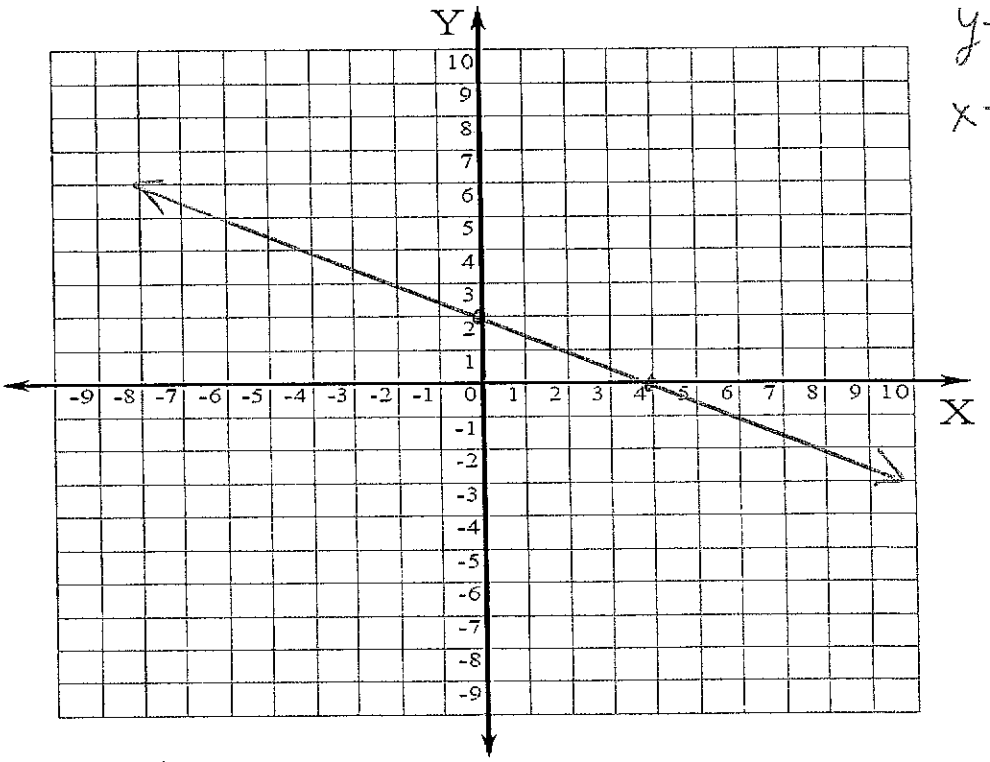
13. Find the x- and y-intercepts and graph the line $y = 2x - 3$.



y-int = (0, -3)

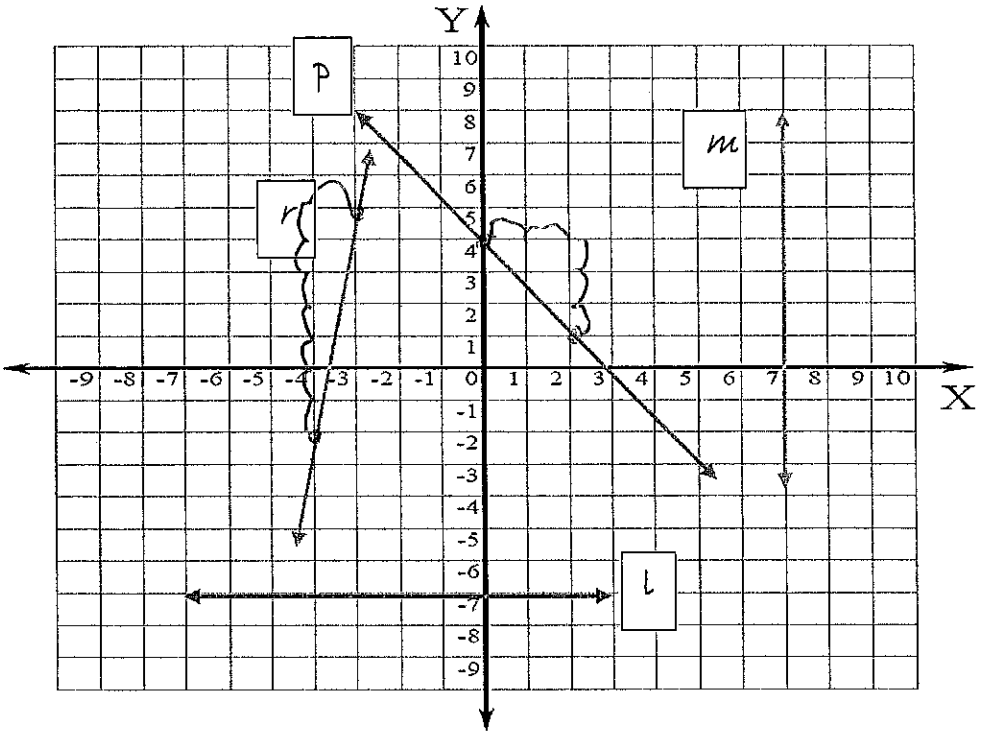
x-int = (3/2, 0)

14. Find the x- and y-intercept and graph the line $x + 2y = 4$.



y-int = (0, 2)

x-int = (4, 0)



15. What is the slope of the line p ? $-\frac{3}{2}$

16. What is the slope of the line perpendicular to line r? $-\frac{1}{\frac{2}{1}}$

17. What is the slope of the line parallel to line l? 0

18. What is the slope of the line m? undefined

Find the slope and y-intercept of the following lines.

19. $2x - 3y = 6$ $-3y = -2x+6$ $y = \frac{2}{3}x - 2$ $\frac{2}{3}$, -2

20. $y = 5$ 0, 5

21. $y = -\frac{3}{4}x - 11$ $-\frac{3}{4}$, -11

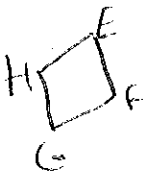
22. Given that quadrilateral TAUL has vertices T(4, 6), A(6, -4), U(-4, -2) and L(-2, -4). Show that TAUL is not a parallelogram.

$TA = \frac{-4-6}{6-4} = \frac{-10}{2} = -5$

$UL = \frac{-4+2}{-2+4} = \frac{-2}{2} = -1$

Slopes of opp. sides not = so not ||

23. Given points E(-4, 1), F(2, 3), G(4, 9), and H(-2, 7).



a. Show the EFGH is a rhombus by showing all 4 sides congruent?

$EF = \sqrt{(1-3)^2+(-4+4)^2}$ $\quad FG = \sqrt{(9-3)^2+(4-2)^2}$

$GH = \sqrt{(-2-9)^2+(-2+4)^2}$ $\quad HE = \sqrt{(7-1)^2+(-2+4)^2}$

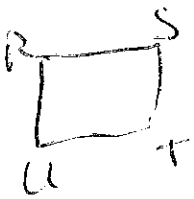
$\sqrt{4+36} = \sqrt{40}$ $\quad \sqrt{36+4} = \sqrt{40}$

b. Use the slopes to verify that the diagonals are perpendicular.

$EG = 1$

$HF = -1$

24. Given points R(-4, 5), S(-1, 9), T(7, 3), and U(4, -1)



a. Show that RSTU is a rectangle by showing opposite sides are parallel and adjacent sides are perpendicular.

$RS = \frac{9-5}{-1+4} = \frac{4}{3}$ ✓ $\quad RU = \frac{-6}{8} = -\frac{3}{4}$ ✓

$UT = \frac{-1-3}{4-7} = \frac{-4}{-3} = 4/3$ $\quad ST = \frac{-6}{8} = -3/4$

b. Use the distance formula to verify that the diagonals are congruent.

$SU = \sqrt{(-1-4)^2+(9+1)^2}$ $\quad RT = \sqrt{(-4-7)^2+(5-3)^2}$

$\sqrt{125+100}$ $\quad \sqrt{121+4}$

$\sqrt{225}$ $\quad \sqrt{125}$

25. A construction company is pouring a concrete foundation. The measures of two sides that meet in a corner are 33ft and 56ft. For the corner to by square (right angle), what would the length of the diagonal have to be?

$33^2 + 56^2 = C^2$

$C = 65$ ft