Algebra 1 (3206) Name: KEY

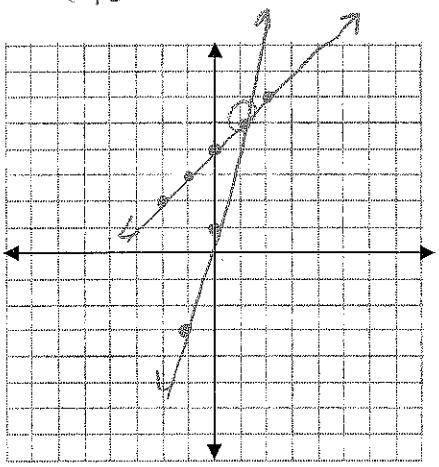
Final Exam review Term 3 Chapter 7

Solve by Graphing:

1. $y = x + 4$

   $y = 4x + 1$

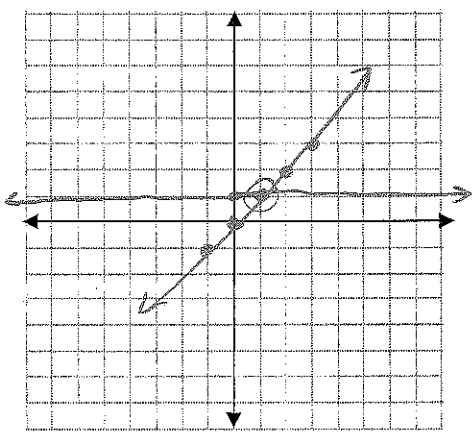
(1,5)



2. $y = 1$

   $y = x$

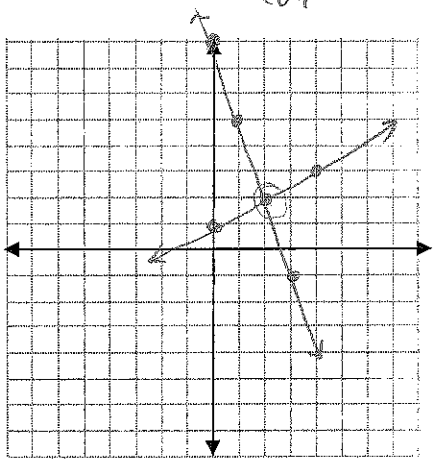
(1,1)



3. $y = \frac{1}{2}x + 1$

   $y = -3x + 8$

(2,2)



Without graphing, tell whether the system has *one solution, no solution,* or *infinitely many* solutions. Hint: make sure the equations are in $y = mx + b$ form.

4. $y = -3x + 7$

   $y = -3x - 4$

Solution: no sol. — parallel

5. $x + y = 4$ $y = -x + 4$

   $2x + 2y = 8$

   $x + y = 4$

   $y = -x + 4$

Solution: inf. many — same line

6. $y = 2x + 1$

   $2x + y = -8$

   $y = -2x - 8$

Solution: one sol.

Solve each system using any method and circle your answer.

7. $y = 6x - 4$

   $y = -2x + 28$

$6x - 4 = -2x + 28$

$\frac{8x}{8} = \frac{32}{8}$ $\boxed{x = 4}$

$y = 6(4) - 4$

$y = 24 - 4$

$\boxed{y = 20}$

(4, 20)

8. $m = 4n + 11$

   $-6n + 8m = 36$

$-6n + 8(4n + 11) = 36$

$-6n + 32n + 88 = 36$

$\frac{26n}{26} = \frac{-52}{26}$

$\boxed{n = -2}$

$m = 4(-2) + 11$

$\boxed{m = 3}$

(3, -2)

9. $2x + 5y = 17$

$6x - 5y = -9$

$\frac{8x}{8} = \frac{8}{8}$ $\boxed{x = 1}$

$2(1) + 5y = 17$ (1,3)

$\frac{5y}{5} = \frac{15}{5}$

$\boxed{y = 3}$

10. $2x - 3y = 61$

$-1(2x + y = -7)$

$2x - 3y = 61$

$-2x - y = 7$

$\frac{-4y}{-4} = \frac{68}{-4}$ $\boxed{y = -17}$

$2x + 17 = -7$

$\frac{2x}{2} = \frac{-24}{2}$

$\boxed{x = -12}$ (-12,17)

11. $y = 2x$

$y = x - 1$

$2x = x - 1$

$\boxed{x = -1}$

$y = 2(-1)$

$\boxed{y = -2}$

(-1,-2)

12. $4(3x - 10y = -25)$

$4x + 40y = 20$

$12x - 40y = -100$

$4x + 40y = 20$

$\frac{16x}{16} = \frac{-80}{16}$ $\boxed{x = -5}$

$4(-5) + 40y = 20$

-20

$\frac{40y}{40} = \frac{40}{40}$

$\boxed{y = 1}$ (-5,1)

Write a system of equations and solve the following problems:

13. The sum of two numbers is 20. Their difference is 4. Find the two numbers.

$x + y = 20$

$x - y = 4$

$2x = 24$

$\boxed{x = 12}$

$12 + y = 20$

$\boxed{y = 8}$

14. Suppose you invest $12,000 in equipment to manufacture a new board game. Each game costs $2.50 to manufacture and sells for $18.00. How many games must you sell for your business to break even?

$12000 + 2.50x = 18x$

$\frac{12000}{15.50} = \frac{15.50x}{15.50}$

774.19 so $\boxed{775 \text{ games}}$

15. The math and science club had fundraisers to buy supplies. The math club spent $135 buying six cases of juice and one case of bottled water. The science club spent $110 buying four cases of juice and two cases of bottled water. How much did each case of juice and each case of water cost?

math $-2(6j + w = 135)$ → $-12j - 2w = -270$

sci $4j + 2w = 110$ → $4j + 2w = 110$

$-8j = -160$

$\frac{-8j}{-8} = \frac{-160}{-8}$

juice: \$20/case

$6(20) + w = 135$

120

$w = 15$

$w = \$15$/case

16. For making a payment, Marie used dimes and quarters only. The payment was for a total of $1.65, and Marie used a total of 9 coins. How many dimes and quarters did she have?

$-10(d + q = 9)$ → $-10d - 10q = -90$

$100(.10d + .25q = 1.65)$ → $10d + 25q = 165$

$10d + 25q = 165$

$15q = 75$

$\frac{15q}{15} = \frac{75}{15}$

$q = 5$

$d = 4$

17. At the football game, the ratio of boys to girls is 5 to 3. There are 104 total people at the game. How many of each gender are at the game?

$5x + 3x = 104$

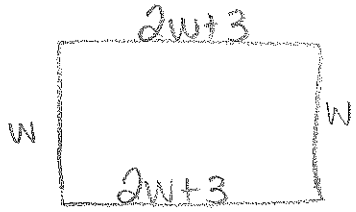
$8x = 104$

$x = 13$

boys $= 5(13) = 65$

girls $= 3(13) = 39$

18. The perimeter of a rectangle is 114 ft. Its length is three more than twice its width. Find the dimensions of the rectangle.



$6w + 6 = 114$

$-6 \quad -6$

$\frac{6w}{6} = \frac{108}{6}$

$w = 18$

$l = 2(18) + 3 = 39$