

Name: _____

Date: _____

Math 9/10 Honors: Section 3.6 Solving Problems with Linear Systems

1. Solve the following systems of equations:

a) $\frac{3}{4}x + \frac{13}{4}y = \frac{21}{4}$ $\frac{1}{4}x + \frac{7}{4}y = \frac{11}{4}$	b) $75x + 270y = 54$ $25x + 90y = 18$
c) $\frac{5}{3}x + \frac{7}{3}y = 37.50$ $\frac{8}{3}x + \frac{4}{5}y = 16$	d) $\frac{8}{3}x + \frac{5}{2}y = -\frac{56}{50}$ $\frac{7}{3}x + \frac{7}{4}y = -0.98$

2. Indicate the number of solutions for each system:

a) $6x + 10y = 24$ $3x + 5y = 12$	b) $19y - 14x = 26$ $7x - 9y = 13$
c) $\frac{2}{3}x + \frac{8}{3}y = 12$ $6x + 18y = 72$	d) $10x - 8y = 15$ $-4x + 3.2y = -6$

$$e) \quad x^2 + y^2 = 25$$

$$2x + 3y = 4$$

$$f) \quad y^2 + x^2 = 1$$

$$4x + 3y = -24$$

3. Two lines have no solution. The equation of the first line is $x - \sqrt{3}y + 2\sqrt{3} = 0$. What is the slope of the 2nd line?
4. When two lines are inconsistent, how many solutions would they have? What does it mean that two lines are inconsistent?
5. Word Problems: The first number is twice the second. The sum of five times the first and 1.5 times the second is equal to 17.25. Find the numbers
6. The first number is 8 times smaller than the second. The sum of four times the first and triple the second is 14. Find the numbers.
7. The second number is two less than the first. The sum of half the first number is one third the second is equal to 8.5. Find the numbers.
8. Under what conditions will the system have no solution?
 $mx + ny = p$
 $vx + wy = z$

9. If $3x - 2y - z = 0$ and $x + y - z = 0$, find the ratio of $x:y$.

10. If the system of equations: $2x + 4y = 3k$ and $x + 2y = 3$ has at least one solution, then "k" can not be what value?

11. If $2x + y = -3$ and $2y - x = 4$, then what is the value of $x + y$?

12. If $(1, 2)$ is a solution to the system $ax + by = 1$ and $bx + ay = 2$, then what is the value of $a - b$?

13. If the straight lines $2x + hy = 11$ and $kx + 4y = 8$ intersect at point $(4, -1)$, then what are the values of "h" and "k"?

14. Given the two systems of equations: $ax + by = c$
 $dx + ey = f$, indicate what happens under each scenario:

a) $\frac{a}{d} = \frac{b}{e} = \frac{c}{f}$

b) $\frac{a}{d} = \frac{b}{e} \neq \frac{c}{f}$

c) $\frac{a}{d} = \frac{c}{f} \neq \frac{b}{e}$

d) $ae = bd, c = 0$

15. Andy invested \$13000 into two different Mutual Fund. The first fund has a return of 3%, and the other at 5%. If the total interest earned in one year is \$530, how much did he invest in each of the mutual funds?

16. Barry borrowed \$155,000 to mortgage his apartment from two different banks. BMO charged an interest of 20%, and Royal Bank at 18.75%. If the amount of interest he paid to both banks in one was equal, how much did he borrow from each bank?
17. A rock concert at GM place sold 17,500 seats. There are level A seats that cost \$20/ticket and level B seats that cost \$50. If total revenue was \$425,000, how many of each seat did they sell?
18. Six hotdogs and 10 burgers cost \$40. 3 Hotdogs and 8 burgers cost \$29.75. How much does each burger cost?
19. Jerry is a stock broker and he own 1000 shares of Starbucks stock. Two months later, he own 1500 shares but the value of each share depreciated to 60% of its original value. Furthermore, the total value of his investments depreciated by \$5000. How much was each share worth before the depreciation?
20. Lucy is taking professional dancing lessons. 9 lessons cost \$725 and 20 lessons will cost her \$1550. If there is a one time administration fee, how much does each lesson cost?
21. In a hockey league, players are awarded from point system where each goal is worth 2 points and assists are worth 1 point. Last season, James earned 130 points. However, if the point system was switched (where goals are worth 1 point and assists 2 points) he would have 110 points. How many goals and assists does he have?
22. Given that $0 < x < y < 100$, what is the number of integer solutions (x,y) to the equation $2x + 3y = 50$: