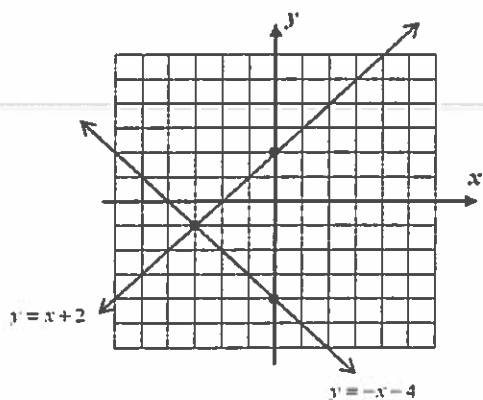
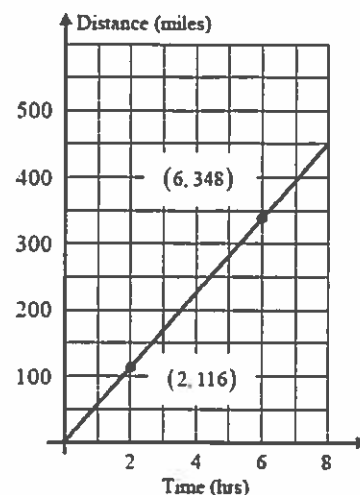


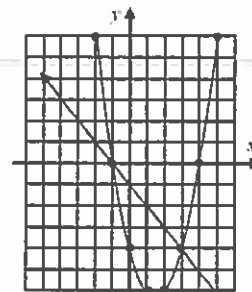
Common Core Regents Review

Linear Functions

- The standard form for a linear equation is $y = mx + b$, where m represents the slope and b represents the y-intercept.
- To determine the slope or **rate of change** of a linear function, use $m = \frac{y_2 - y_1}{x_2 - x_1}$, positive slopes, rises from left to right, negative slope, falls from left to right.
- Parallel lines have equal slopes; lines parallel to the x-axis have a zero slope; lines parallel to the y-axis have no slope or are said to be undefined.
- A system of linear (or quadratic) equations are two or more functions graphed in the same coordinate plane; to find the solution graphically of a system of equations find the point of intersection. This is the point common to both linear functions.

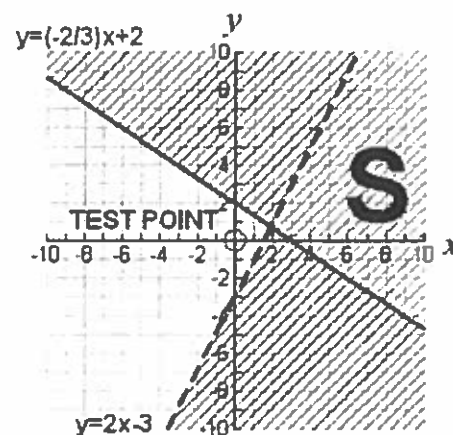


The axes of a coordinate plane are generally labeled x and y ; however, when graphing real-life situations other labels may be more appropriate for the problem, i.e. months, money, etc



- To find the solution algebraically of a system of linear equations use elimination or substitution

- To graph a linear inequality (and system of inequality) in two variables, graph the inequality using the rules for linear graphing. If the inequality is *less than* ($<$) or *greater than* ($>$), the line is "dashed"; if the inequality is *less than or equal to* (\leq) or *greater than or equal to* (\geq), the line is solid
- Since there are infinite solutions for all of the inequality symbols, shade above the line for greater than, shade below the line for less than; the solution to an inequality system is where the shading overlaps, S



Solving linear systems algebraically

1.

$$\begin{aligned}4x + 3y &= 27 \\ y &= 2x - 1\end{aligned}$$

2.

$$\begin{aligned}y &= x + 3 \\ 3x + 2y &= 26\end{aligned}$$

3.

$$\begin{aligned}8x + 5y &= 9 \\ 2x - 5y &= -4\end{aligned}$$

4.

$$\begin{aligned}5x + 3y &= 14 \\ 2x + y &= 6\end{aligned}$$

5.

$$\begin{aligned}2x + 3y &= 7 \\ 4x - 5y &= 25\end{aligned}$$

6.

$$\begin{aligned}3x + 5y &= 7 \\ 2x + 4y &= 6\end{aligned}$$

7. The sum of two numbers is 36. Their difference is 24. Find the numbers.

8. The owner of men's clothing store bought six belts and eight hats for \$140. A week later, at the same prices, he bought nine belts and six hats for \$132. Find the price of a belt and the price of a hat.

9. What is the y-intercept of the line whose equation is $y = 6x - 7$?

- (1) -6 (2) 6 (3) 7 (4) -7

10. Which ordered pair is the solution for the system of equations below?

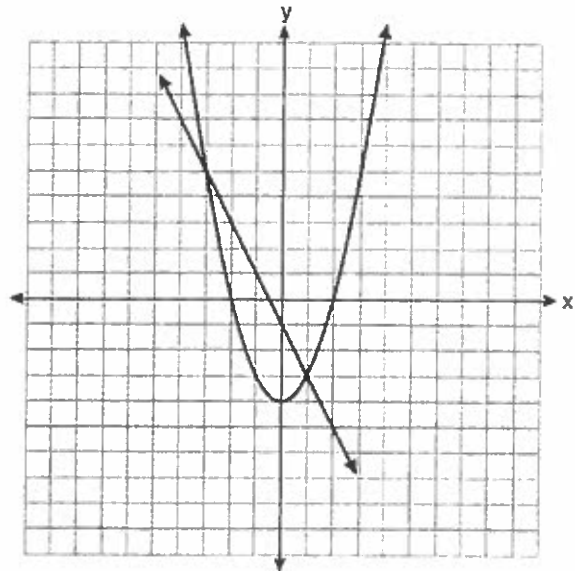
$$2x + y = 18$$

$$x - y = -6$$

- (1) (4,10) (2) (4,-10) (3) (8,3) (4) (6,12)

11. Which ordered pair is a solution of the system of equations shown in the graph below?

- (1) (-3,1) (2) (-3,5) (3) (0,-1) (4) (0,-4)



12. What is the slope of the line that passes through the points $(-6, 1)$ and $(4, -4)$?

- (1) -2 (2) 2 (3) $-\frac{1}{2}$ (4) $\frac{1}{2}$

13. What is the solution of the system of equations $c + 3d = 8$ and $c = 4d - 6$?

- (1) $c = -14, d = -2$ (2) $c = -2, d = 2$ (3) $c = 2, d = 2$ (4) $c = 14, d = -2$

14. Same as #12 sorry.

15. Which equation represents a line that is parallel to the line $y = -4x + 5$?

- (1) $y = -4x + 3$ (2) $y = -\frac{1}{4}x + 5$ (3) $y = \frac{1}{4}x + 3$ (4) $y = 4x + 5$

16. What is the solution set of the following system of equations?

$$x + y = 7$$

$$x - y = 3$$

- (1) $(3, 4)$ (2) $(5, 2)$ (3) $(10, -3)$ (4) $(8, -1)$

17. In a linear equation, the independent variable increases at a constant rate, while the dependent variable decreases at a constant rate. The slope of this line is:

- (1) zero (2) negative (3) positive (4) undefined

18. Which ordered pair is in the solution set of the system of equations $y = -x + 1$ and $y = x^2 + 5x + 6$?

- (1) $(-5, -1)$ (2) $(-5, 6)$ (3) $(5, -4)$ (4) $(5, 2)$

19. Samuel's Car service will charge a flat travel fee of \$4.75 for anyone making a trip. They charge an additional set rate of \$1.50 per mile that is traveled. Which is an equation that represents the charges?

- (1) $y = 1.5x + 1.5$ (2) $y = 4.75x + 4.75$ (3) $y = 1.5x + 4.75$ (4) $y = 4.75x + 1.5$

20. Jerome collects stamps. He saved \$100 to buy stamps to add to his collection. The stamps cost \$1.50, \$2, or \$5. Which equation models the different ways that Jerome can spend his money where x represents the number of 1.50 stamps, y represents the number of \$2 stamps, and z represents the number of \$5 stamps?

- (1) $7.50x = 100$ (2) $15xyz = 100$ (3) $1.5x + 2y + 5z = 100$ (4) $\frac{x}{1.5} + \frac{y}{2} + \frac{z}{5} = 100$

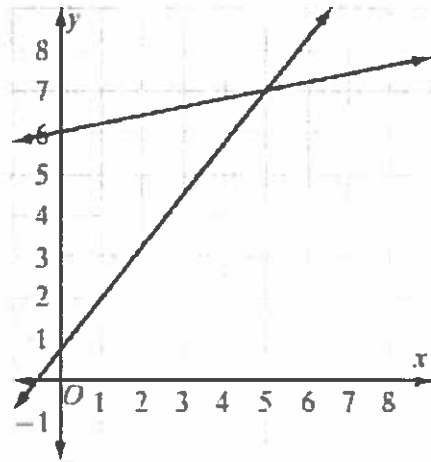
21. What is the solution of the system of equations $2x - 5y = 11$ and $-2x + 3y = -9$?

- (1) $(-3, -1)$ (2) $(-1, 3)$ (3) $(3, -1)$ (4) $(3, 1)$

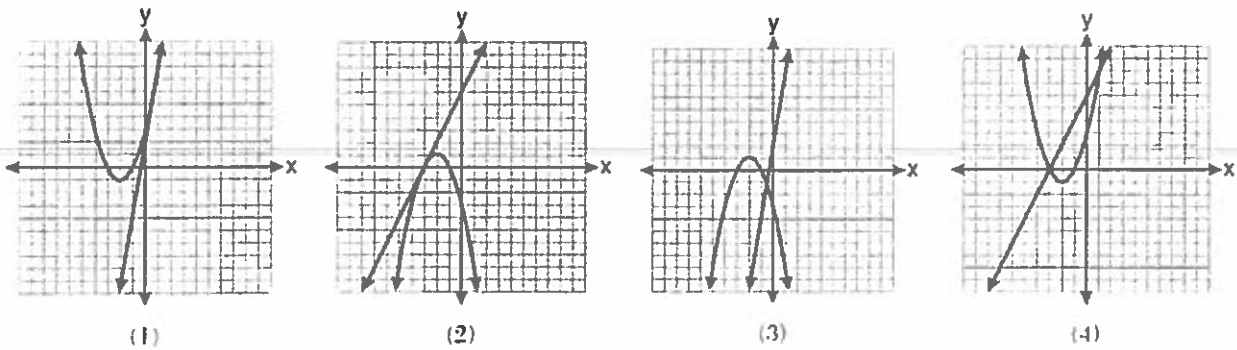
22. The graph below represents a system of linear equations.

What is the solution set of this system?

- (1) $\left(0, \frac{3}{4}\right)$ (2) $(0, 6)$ (3) $(5, 7)$ (4) $(7, 5)$



23. Which graph could be used to find the solution to the system $y = 2x + 6$ and $y = x^2 + 4x + 3$?



24. The cost of three notebooks and four pencils is \$8.50. The cost of five notebooks and eight pencils is \$14.50. Determine the cost of one notebook and the cost of one pencil.

25. Costco charges \$15.00 for membership. Their prices are less than those found in a supermarket. For a gallon of milk, they charge \$1.50. The local supermarket charges \$3.00 per gallon.

a. Create an equation for the cost of buying x gallons of milk from each of the two stores.

▪ Cost, C_1 , of buying milk from Price Club _____

▪ Cost, C_2 , of buying milk from supermarket _____

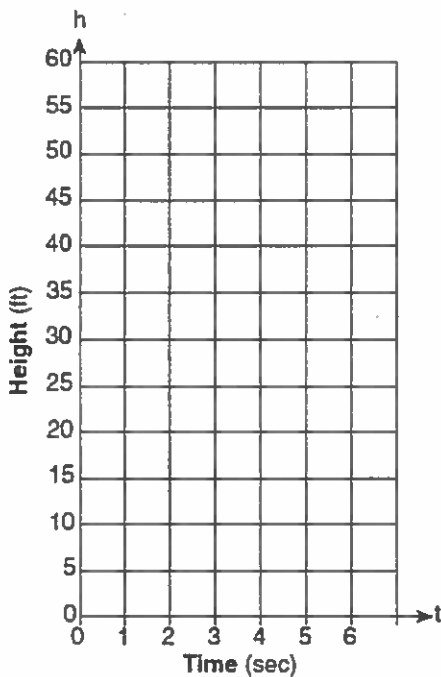
b. How many gallons of milk would you have to buy in order to have spent the same amount of money at each store?

▪ Gallons: _____

26. Tom throws a ball into the air. The ball travels on a parabolic path represented by the equation, $h = -8t^2 + 32t + 3$, where h is the height, in feet, of the ball, and t is the time in seconds.

a. On the graph below, graph the function from $t = 0$ to $t = 4$ seconds.

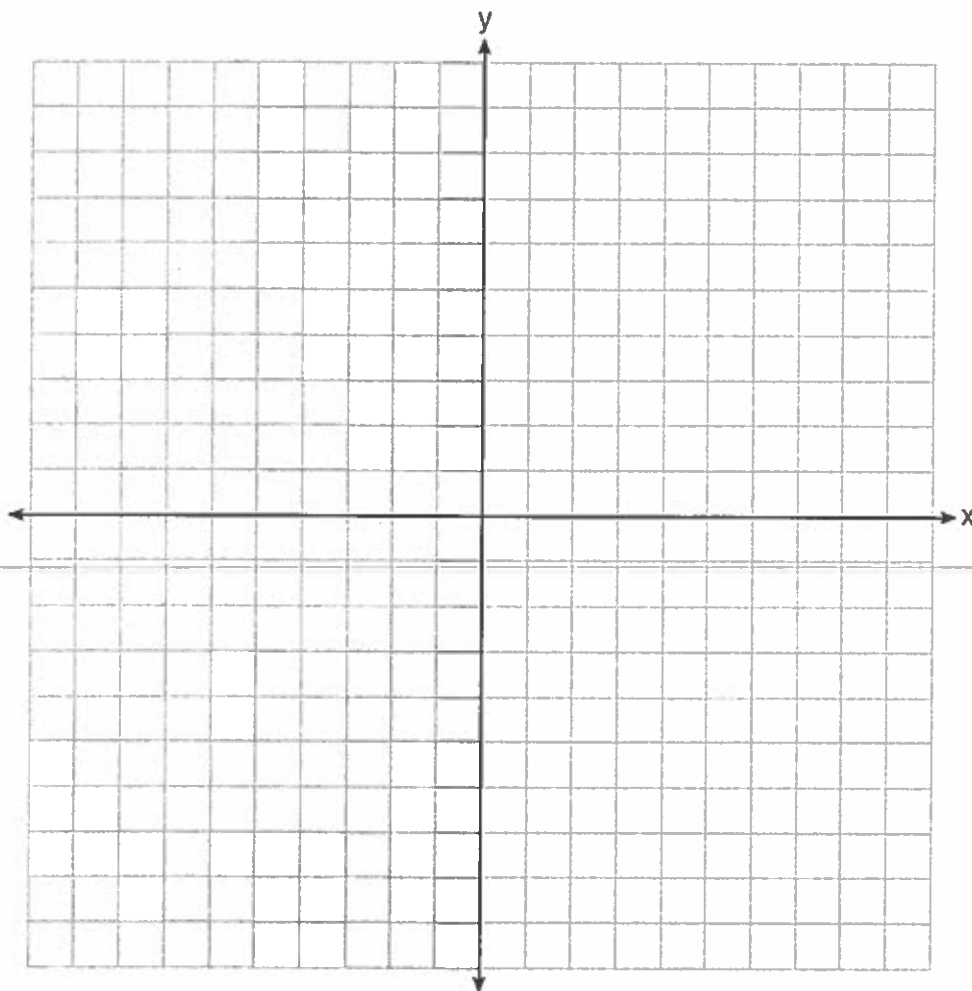
b. What is the value of t at which h has its greatest value? _____



27. On the set of axes below, solve the following system of equations graphically for all values of x and y . State the coordinates of all the solutions.

$$y = x^2 + 4x - 5$$

$$y = 2x + 3$$



Coordinate Geometry

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

