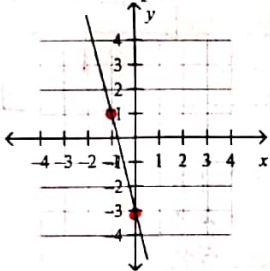


## Algebra 1 - Semester 2 Exam Review

Ch. 5 - Graphing Linear Equations

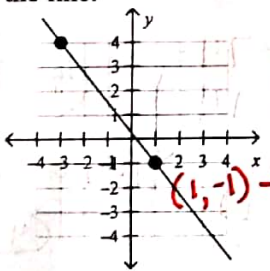
- 1 A student finds the slope of the line between (16, 2) and (20, 7). She writes  $\frac{2-7}{20-16}$ . What mistake did she make?
- A She used y-values where she should have used x-values.
- B She should have added the values, not subtracted them.
- C She did not keep the order of the points the same in numerator and the denominator.**
- D She mixed up the x- and y-values.

- 2 Find the slope of the line.



$$m = \frac{-4}{1} = -4$$

- 3 Write the slope-intercept form of the equation for the line.



$$m = -\frac{5}{4}$$

$$b = -2\frac{1}{4}$$

$$y = -\frac{5}{4}x - 2\frac{1}{4}$$

$$(1, -1) \rightarrow -1 = -\frac{5}{4}(1) + b$$

$$-1 = -\frac{5}{4} + b$$

$$-2\frac{1}{4} = b$$

- 4 Write the equation of the line with a slope of 3 that passes through the point (-2, -4).

$$m = 3$$

$$b = 2$$

$$y = 3x + 2$$

$$-4 = 3(-2) + b$$

$$-4 = -6 + b$$

$$2 = b$$

- 5 Write an equation in slope-intercept form for the line that passes through (6, 4) and (5, 7).

$$m = -3$$

$$b = 22$$

$$y = -3x + 22$$

$$m = \frac{7-4}{5-6} = -\frac{3}{1} = -3$$

$$4 = -3(6) + b$$

$$4 = -18 + b$$

$$22 = b$$

- 6 Tell whether the lines for each pair of equations are parallel, perpendicular, or neither.

$$y = -4x + 2$$

$$m = -4$$

$$-x + 4y = -16$$

$$+x \quad +x$$

$$m = \frac{1}{4}$$

**perpendicular**

$$y = \frac{1}{4}x - 4$$

$$y = \frac{1}{4}x - 4$$

- 7 Write an equation in slope-intercept form for the line perpendicular to  $y = 3x - 8$  that passes through the point (9, -8).

$$m = 3 \rightarrow m = -\frac{1}{3}$$

$$y = -\frac{1}{3}x - 5$$

$$-8 = -\frac{1}{3}(9) + b$$

$$-8 = -3 + b$$

$$-5 = b$$

- 8 The grocery store sells kumquats for \$4.25 a pound and Asian pears for \$4.00 a pound. Write an equation in standard form for the weights of kumquats  $k$  and Asian pears  $p$  that a customer could buy with \$12.

$$\$4.25k + \$4p = \$12$$

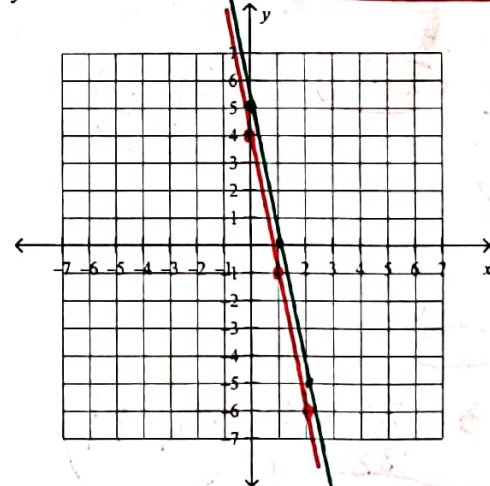
## Chapter 6 - Systems of Equations

- 9 Graph the system of equations and tell whether there is no solution, one solution, or infinitely many solutions.

$$y = -5x + 4$$

$$y = -5x + 5$$

**No Solution**



- 10 Tell whether the ordered pair  $(5, -2)$  is a solution of the system

$$\begin{cases} 3x - 2y = 19 \\ -3x - y = -14 \end{cases}$$

$$3(5) + 2(-2) = 19 \quad -3(5) + (-2) = -14$$

$$15 + 4 = 19$$

$$19 = 19$$

No

$$-15 + 2 = -14$$

$$-13 = -14$$

- 11 Solve  $\begin{cases} 3x + y = 5 \\ x - 3 = \end{cases}$  by using substitution. Express your answer as an ordered pair.

$$3x + x - 3 = 5$$

$$4x - 3 = 5$$

$$+3 \quad +3$$

$$4x = 8$$

$$x = 2$$

$$y = 2 - 3$$

$$y = -1$$

$(2, -1)$

- 12 Solve  $\begin{cases} 4x - 4y = -24 \\ -x + 4y = 21 \end{cases}$  by using elimination. Express your answer as an ordered pair.

$$3x = -3$$

$$x = -1$$

$$4(-1) - 4y = -24$$

$$-4 - 4y = -24$$

$$+4 \quad +4$$

$$-4y = -20$$

$$y = 5$$

$(-1, 5)$

- 13 Solve  $\begin{cases} x - 4y = -13 \\ 7x + 4y = 45 \end{cases}$  by using elimination. Express your answer as an ordered pair.

$$8x = -8$$

$$x = -1$$

$$(-1) - 4y = -13$$

$$+1 \quad +1$$

$$-4y = -12$$

$$y = 3$$

$(-1, 3)$

- 14 Solve the system of equations using the method of your choice.

$$y = 3x + 7$$

$$y = 4x + 3$$

$$4x + 3 = 3x + 7$$

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

$$x + 3 = 7$$

$$-3 \quad -3$$

$$x = 4$$

$$y = 3(4) + 7$$

$$y = 12 + 7$$

$$y = 19$$

$(4, 19)$

- 15 Solve the system of equations using the method of your choice.

$$\begin{cases} 5x - 3y = -16 \rightarrow \times \text{ by } 2 \rightarrow 10x - 6y = -32 \\ 4x + 2y = -4 \rightarrow \times \text{ by } 3 \rightarrow 12x + 6y = -12 \end{cases}$$

$$4(-2) + 2y = -4$$

$$-8 + 2y = -4$$

$$+8 \quad +8$$

$$2y = 4$$

$$y = 2$$

$$x = -2$$

- 16 The Fun Guys game rental store charges an annual fee of \$10 plus \$6.50 per game rented. The Game Bank charges an annual fee of \$34 plus \$4.50 per game. For how many game rentals will the cost be the same at both stores? What is that cost?

$$\$10 + \$6.50x = \$34 + \$4.50x$$

$$-4.50x \quad -4.50x$$

$$10 + 2x = 34$$

$$-10 \quad -10$$

$$2x = 24$$

$$x = 12 \text{ games}$$

$$\$88 \text{ total}$$

- 17 Janice's Jelly Donut Store has \$2500 in expenses each month plus it costs \$2 per dozen donuts to make them. She sells donuts for 7 per dozen. How many dozen must she sell each month to break even?

$$2500 + 2x = 7x$$

$$-2x \quad -2x$$

$$2500 = 5x$$

$$500 \text{ donuts} = x$$

- 18 The sum of two numbers is 74. Their difference is 14. Write a system of equations that describes this situation. Solve by elimination to find the two numbers.

$$x + y = 74$$

$$+ \quad x - y = 14$$

$$2x = 88$$

$$x = 44$$

$(44, 30)$

- 19 Sharon has some one-dollar bills and some five-dollar bills. She has 14 bills. The value of the bills is \$30. Solve a system of equations using elimination to find how many of each kind of bill she has.

$$\text{Mult by } -1 \rightarrow -x + y = -14$$

$$+ \quad x + 5y = 30$$

$$4y = 16$$

$$y = 4$$

$$x + 4 = 14$$

$$x = 10$$

10, \$1 bills  
4, \$5 bills



## Chapter 7 - Exponents

20 Simplify  $2^{-3}$ .

$$\frac{1}{2^3} = \frac{1}{8}$$

21 Evaluate  $a^{-2}b^0$  for  $a = -3$  and  $b = -3$ .

$$(-3)^{-2}(-3)^0 = \frac{1}{3^2} = \frac{1}{9}$$

22 Simplify  $\frac{9x^0y^{-8}}{z^{-8}}$ .

$$\frac{9z^8}{y^8}$$

23 Simplify  $m^3 \cdot y^6 \cdot m^2$ .

$$m^5y^6$$

24 Simplify  $(x^5)^{-8}x^4$ .

$$x^{-40} \cdot x^4 = x^{-36} = \frac{1}{x^{36}}$$

25 Simplify  $(m^2n^{-3})^2(-m^{-3}n^3)^3$ .

$$m^4n^{-6} \cdot -m^{-9}n^9 = -m^{-5}n^3 = -\frac{n^3}{m^5}$$

26 Simplify  $\frac{y^6z^{12}}{(yz)^3}$ .

$$y^3z^9$$

27 Simplify  $\left(\frac{2m^8}{m^2n^4}\right)^4 \cdot \frac{2^4m^{82}}{m^8n^{16}}$ .

$$\frac{16m^{24}}{n^{16}}$$

28 Simplify  $(x^9)^0(x^7)^2$ .

$$x^0x^{14} = x^{14}$$

29 Simplify  $(-5g^5h^6)^2(g^4h^2)^4$ .

$$5^2g^{10}h^{12} \cdot g^{16}h^8 = 25g^{26}h^{20}$$

30 Which function is greater at the given value?

$y = 2^x$  or  $y = x^2$  at  $x = 9$

$$y = 2^9$$

$$y = 9^2$$

$$y = 512$$

$$y = 81$$

31 Suppose the population of a town is 2,700 and is growing 4% each year.

a. Write an equation to model the population growth.

$$2,700(1.04)^t$$

b. Predict the population after 12 years.

$$2,700(1.04)^{12}$$

$$4,322 \text{ or } 4,323$$

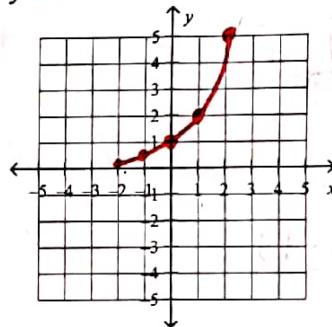
32 Find the balance in the account.  
\$2,400 principal earning 2%, compounded annually, after 7 years

$$2,400(1.02)^7$$

$$2,756.68$$

33 Graph the equation by making a table.

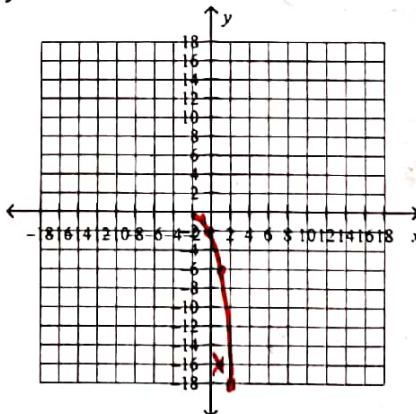
$$y = 2^x$$



x	y
-2	$\frac{1}{4} = 2^{-2}$
-1	$\frac{1}{2} = 2^{-1}$
0	$1 = 2^0$
1	$2 = 2^1$
2	$4 = 2^2$

34 Graph the equation by making a table.

$$y = -2 \cdot 3^x$$



x	y
-2	$-\frac{2}{9}$
-1	$-\frac{2}{3}$
0	-2
1	-6
2	-18

## Ch. 8 - Polynomials

- 35 Write the polynomial in standard form. Then name the polynomial based on its degree and number of terms.

$$2 - 11x^2 - 8x + 6x^2$$

$$-5x^2 - 8x + 2$$

Deg: Quadratic  
Term: Trinomial

- 36 Write the polynomial in standard form. Then give the leading coefficient.

$$-10x^3 + 2x + 12x^4 + x^2 - 5x^5 + 10$$

$$-5x^5 + 12x^4 - 10x^3 + x^2 + 2x + 10$$

-5

- 37 Simplify each sum or difference.

$$(4d^4 + d^2) + (d^4 + 7d^2 - 1)$$

$$5d^4 + 6d^2 - 1$$

- 38 Simplify each sum or difference.

$$(8w^2 + 4w + 4) + (7w^2 + 3w + 3)$$

$$2w^2 - 7w - 1$$

- 39 Simplify each sum or difference.

$$(3b^5 + b^3) + (7b^5 + 7b^3 + 2)$$

$$2b^5 - 8b^3 + 2$$

- 40 Find the product.

$$8p(-3p^2 + 6p - 2)$$

$$-24p^3 + 48p^2 - 16p$$

- 41  $4a^6(6a^6 - 2b^2)$

$$24a^{12} - 8a^6b^2$$

- 42  $(4x + 7)(5x - 3)$

$$20x^2 - 12x + 35x - 21$$

$$20x^2 + 23x - 21$$

- 43  $(2n + 2)(2n - 2)$

Mult the Cong.

$$4n^2 - 4$$

Diff. of 2 perfect sqrs.

- 44  $(3x - 7)(3x - 5)$

$$9x^2 - 15x - 21x + 35$$

$$9x^2 - 36x + 35$$

- 45  $(5x - 3)(x^3 - 5x + 2)$

$$5x^4 - 25x^2 + 10x - 3x^3 + 15x - 6$$

$$5x^4 - 3x^3 - 25x^2 + 25x - 6$$

- 46  $(2x - 6)^2$

$$4x^2 - 24x + 36$$

- ~~47~~ Factor the polynomial.  
 $r^2 - 36$

- ~~48~~ Factor the polynomial.  
 $16b^2 - 81$

- ~~49~~ The length of a rectangle is  $3x - 4$ . The area is  $6x^2 - 2x - 8$ . What is the other side length?