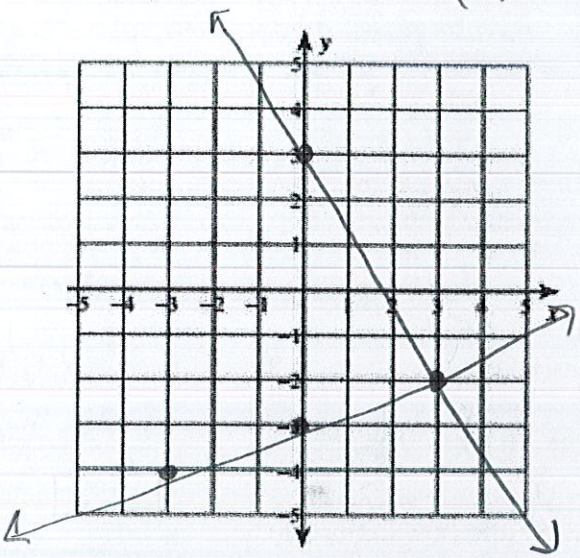
Unit 5 Review

Solve system of linear equations by graphing.

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

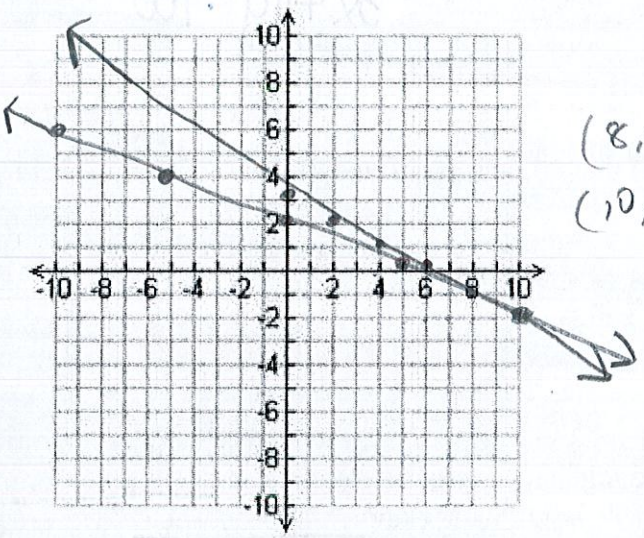
$$y = \frac{1}{3}x - 3$$

(3, -2)



$-2x - 5y = -10 \rightarrow y = -\frac{2}{5}x + 2$

$3x + 6y = 18 \rightarrow y = -\frac{1}{2}x + 3$



(8, -1) ?

(10, -2)

Solve system of linear equations by substitution.

$-3x - 3y = 3$

$y = -5x - 17$

$y = -5(-4) - 17$

$= 20 - 17$

$= 3$

(-4, 3)

$-3x - 3(-5x - 17) = 3$

$-3x + 15x + 51 = 3$

$12x = -48$

$x = -4$

$y = -3x + 5$

$5x - 4y = -3$

$y = -3(1) + 5$

$= -3 + 5$

$= 2$

(1, 2)

$5x - 4(-3x + 5) = -3$

$5x + 12x - 20 = -3$

$17x - 20 = -3$

$17x = 17$

$x = 1$

Solve system of linear equations by elimination.

$x - y = 11$

$2x + y = 19$

$3x = 30$

$x = 10$

$2(10) + y = 19$

$20 + y = 19$

$y = -1$

(10, -1)

$-4x + 9y = 9$

$[x - 3y = -6]\ 3$

$-4x + 9y = 9$

$3x - 9y = 18$

$-x = -9$

$x = 9$

$-4(9) + 9y = 9$

$-36 + 9y = 9$

$9y = 45$

$y = 5$

(9, 5)

Linear Systems Word Problems

1. A test has twenty questions worth 100 points. The test consists of True/False questions worth 3 points each and multiple choice questions worth 11 points each. How many multiple choice questions are on the test?

x = # of T/F
y = # of MC

Equation 1: $[x+y=20]\ -3$

Equation 2: $3x+11y=100$

$-3x-3y=-60$

$8y=40 \quad y=5$

Solution: 5 MC Question

2. The difference of two numbers is 3. Their sum is 13. What are the two numbers?

Equation 1: _____

Equation 2: _____

Solution: _____

3. The admission fee at a small fair is $1.50 for children and $4.00 for adults. On a certain day 2200 people enter the fair and $5050 is collected. How many children and how many adults attended?

x = # children
y = # adults

Equation 1: $[x+y=2{,}200]\ -4$

Equation 2: $1.50x+4y=5050$

$-4x-4y=-8800$

$-2.50x=-3750$

$x=1{,}500$ children

Solution: $y=700$ adults

4. At an ice cream parlor, ice cream cones cost $1.10 and sundaes cost $2.35. One day, the receipts for a total of 172 cones and sundaes were $294.20. How many cones were sold?

x = # of cones
y = # of sundaes

Equation 1: $[x+y=172]\ -2.35$

Equation 2: $1.10x+2.35y=294.20$

$-2.35x-2.35y=-404.20$

$-1.25x=-110$

Solution: 88 cones

5. Lisa goes to the mall one day and buys four shirts and three pairs of pants for $85.50. She returns the next day and buys three shirts and five pairs of pants for $115.00. What is the price of each shirt and each pair of pants?

x = # of shirts
y = # of pants

Equation 1: $4x+3y=85.50\ ]\ -3$

Equation 2: $3x+5y=115\ ]\ 4$

$-12x-9y=-256.5$

$12x+20y=460$

$11y=199.5$

$x=\$7.77$ per shirt
$y=\$18.14$ per pant

Solution: _____

① $2x+y=0$
$x+4y=-7$

$(1,-2)$

$2(1)+(-2)=0$
$2+-2=0$ ✓

$1+4(-2)=-7$
$1-8=-7$
$-5=-7$ ×

$(1,-2)$ is not a solution

② $2x-y=-10$
$-x+y=4$

$(-6,-2)$

$2(-6)-(-2)=-10$
$-12+2=-10$
$-10=-10$ ✓

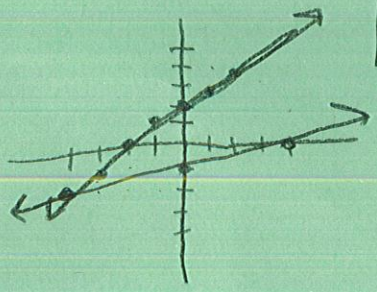
$-(-6)+(-2)=4$
$6-2=4$
$4=4$ ✓

$(-6,-2)$ is a solution

③ $y=-x-2$
$y=-x+3$

* Notice right away my slopes are the same (-1)
* Same slope means parallel lines
* NO solution

④ $y=x+2$
$y=\frac{1}{4}x-1$



$(-4,-2)$

$-2=-4+2$
$-2=-2$ ✓

$-2=\frac{1}{4}(-4)-1$
$-2=-1-1$
$-2=-2$ ✓

⑤ $-7x+8y=6$
$x+4y=-6 \rightarrow x=-4y-6$

$-7(-4y-6)+8y=6$
$28y+42+8y=6$
$36y+42=6$
$36y=-36$
$y=-1$

$x=-4y-6$
$x=-4(-1)-6$
$x=4-6$
$x=-2$

$(-2,-1)$

(6) $8x + 2y = 16$

$x - y = 7 \rightarrow x = y + 7$

$8(y+7) + 2y = 16$

$8y + 56 + 2y = 16$

$10y + 56 = 16$

$10y = -40$

$y = -4$

$x - y = 7$

$x - (-4) = 7$

$x + 4 = 7$

$x = 3$

$(3, -4)$

(7) $12x - 8y = 12$

$6x - 7y = -12$

$-2[6x - 7y = -12]$

$-12x + 14y = 24$

$+ \; 12x - 8y = 12$

$6y = 36$

$y = 6$

$12x - 8(6) = 12$

$12x - 48 = 12$

$12x = 60$

$x = 5$

$(5, 6)$

(8) $-2x - 7y = 6$

$-x - 3y = 3$

$-2[-x - 3y = 3]$

$2x + 6y = -6$

$-2x - 7y = 6$

$-y = 0$

$y = 0$

$-2x - 7(0) = 6$

$-2x = 6$

$x = -3$

$(-3, 0)$

(9) Substitution

$-3x + y = 17 \rightarrow y = 3x + 17$

$8x + 7y = 3$

$8x + 7(3x + 17) = 3$

$8x + 21x + 119 = 3$

$29x + 119 = 3$

$29x = -116$

$x = -4$

$y = 3(-4) + 17$

$y = -12 + 17$

$y = 5$

$\boxed{(-4, 5)}$

(10) $3x - 3y = -3$

$-5x + 9y = 29$ Elimination

$3[3x - 3y = -3]$

$9x - 9y = -9$

$-5x + 9y = 29$

$4x = 20$

$x = 5$

$-5(5) + 9y = 29$

$-25 + 9y = 29$

$9y = 54$

$y = 6$

$\boxed{(5, 6)}$

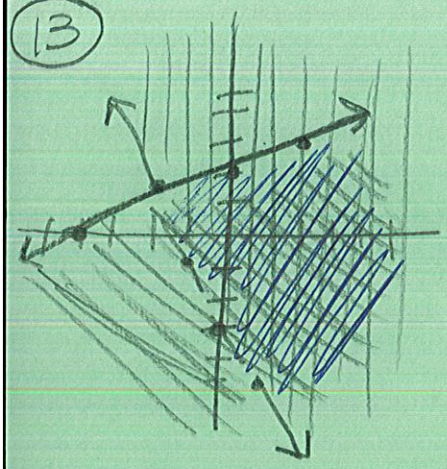
(11) One solution → intersect of lines → one x one y

No solution → parallel lines → # = different #

$x = \frac{\#}{0}$

Infinitely Many → same lines → # = the same #

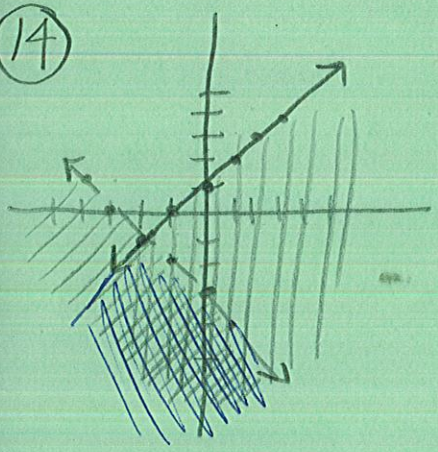
(13)



$y > -2x - 3$

$y \leq \frac{1}{2}x + 2$

(14)



$y \leq x + 1$

$y < -x - 3$

(15) $(0,1)$ YES

$(-1,-1)$ NO

$(-2,3)$ NO

$(-5,-5)$ NO

(16) $(1,2)$ NO

$(-2,-4)$ YES

$(-3,0)$ NO

$(3,1)$ NO

Graphing Linear Systems Practice

1. Solve the following system of equations by graphing.

$-4x + 3y = -12$ (1)

$-2x + 3y = -18$ (2)

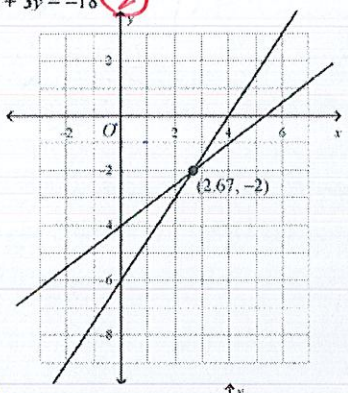
$3y = 4x - 12$

$y = \frac{4}{3}x - 4$

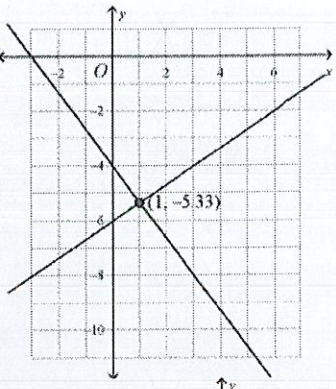
$3y = 2x - 18$

$y = \frac{2}{3}x - 6$

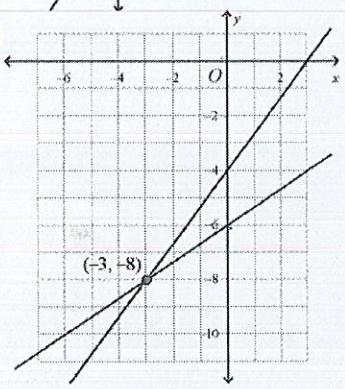
a.



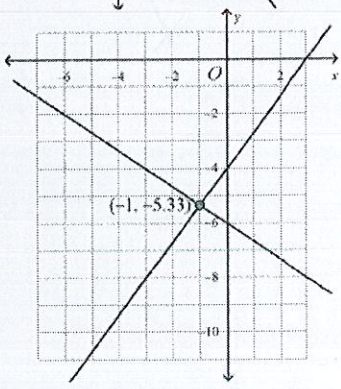
c. X



b.



X



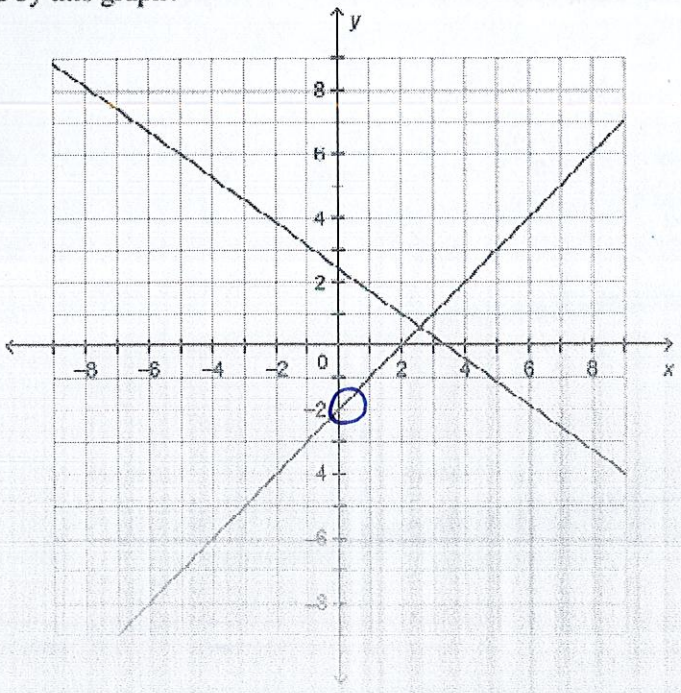
2. Which linear system is represented by this graph?

a) $x - y = 2$ $y = x - 2$
$5x + 7y = 17$

b) $x - y = 4$ $y = x + 4$
$5x + 7y = 17$

c) $x - y = 6$ $y = x - 6$
$6x + 7y = 17$

d) $x - y = 8$ $y = x - 8$
$7x + 5y = 17$



Graphing Linear Systems Practice

3. Which graph represents the solution of the linear system:

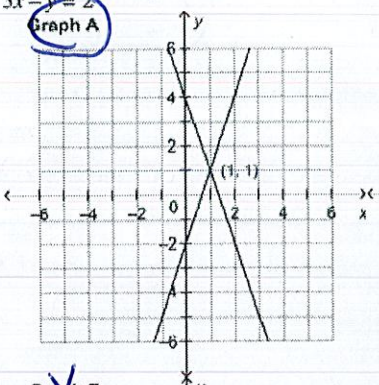
$-3x - y = -4$ (1)

$3x - y = 2$

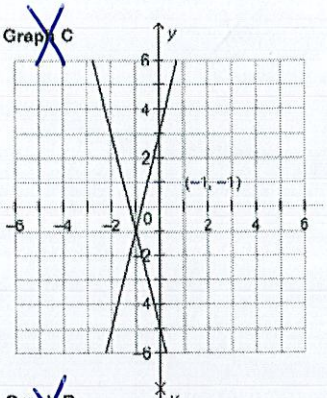
$-y = 3x - 4$

$y = -3x + 4$

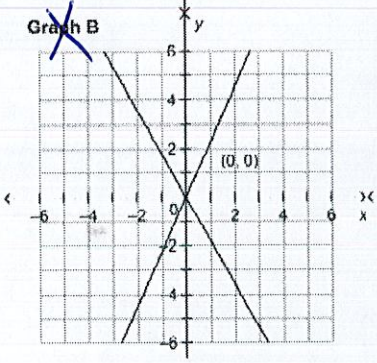
Graph A



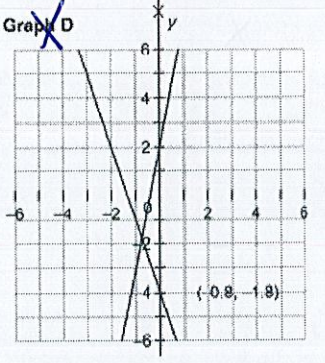
Graph C



Graph B



Graph D

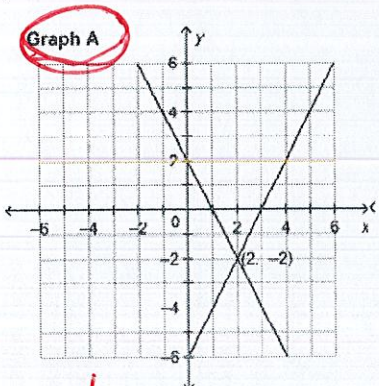


4. Which graph represents the solution of the linear system:

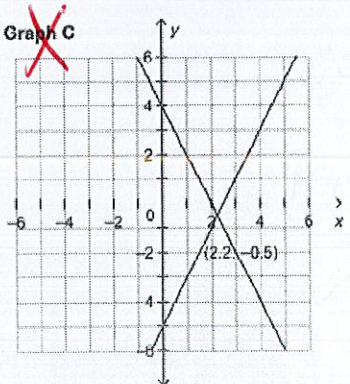
$y = -2x + 2$

$y + 6 = 2x$

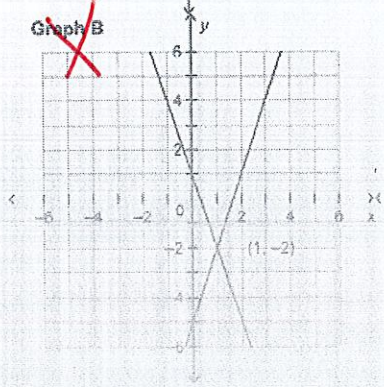
Graph A



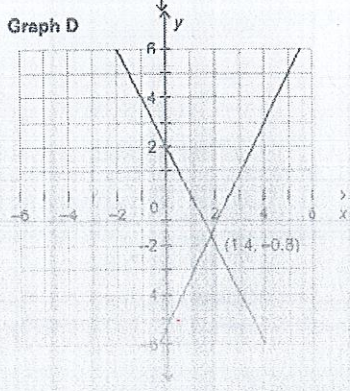
Graph C



Graph B



Graph D



Answers to Word Problems Practice (ID: 1)

1) A
2) C
3) B
4) B
5) C
6) C
7) A
8) A
9) B
10) B

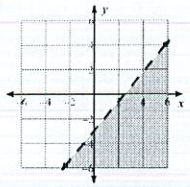
Answers to Elimination Practice (ID: 1)

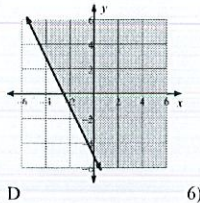
1) $(0, 3)$
2) $(0, -10)$
3) $(-8, 8)$
4) $(-2, -1)$
5) B
6) B
7) D
8) D
9) B
10) B

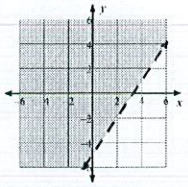
Answers to Substitution Practice (ID: 1)

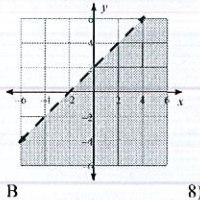
1) $(3, 5)$
2) $(-4, 2)$
3) $(3, -8)$
4) $(2, -5)$
5) C
6) A
7) B
8) A
9) A
10) C

Answers to Graphing Inequalities Practice (ID: 1)

1) 

2) 

3) 

4) 

5) D

6) C

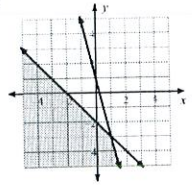
7) B

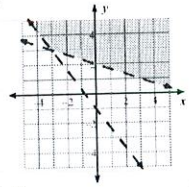
8) B

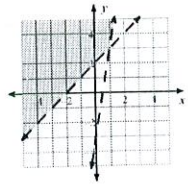
9) B

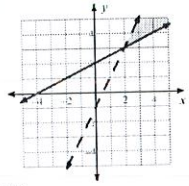
10) B

Answers to Graphing Systems of Inequalities Practice (ID: 1)

1) 

2) 

3) 

4) 

5) D

6) D

7) D

8) C

9) C

10) D

Did You Hear About...

A THE	B FARMER	C WHO	D FED	E HIS	F COW
G BIRDSEED	H AND	I STARTED	J SELLING	K CHEEP	L MILK ?

Solve each system of equations below using multiplication with the addition method. Find the solution in the answer column and notice the word next to it. Write this word in the box containing the letter of that exercise. Keep working and you will hear about some "udder" nonsense.

(A) $5x - 2y = 4$
$3x + y = 9$ (2, 3)

(B) $3x - 5y = 13$
$x - 2y = 5$ (1, -2)

(C) $7x + 2y = -1$
$3x - 4y = 19$ (1, -4)

(D) $x + 2y = 6$
$5x + 3y = 2$ (-2, 4)

(E) $2x + 3y = 7$ (2, 1)
$3x + 4y = 10$

(F) $7x - 3y = -5$ (-1, 4)
$3x + 2y = 11$

(G) $3x - 5y = 7$ (-1, -2)
$5x - 2y = -1$

(H) $4x + 3y = 9$ (0, 3)
$3x + 4y = 12$

(I) $5x - 3y = 16$
$4x + 5y = -2$ (2, -2)

(J) $4x - 3y = -20$
$-x - 8y = 5$ (-5, 0)

(K) $-3x + 7y = -1$
$-2x + 5y = 0$ (5, 2)

(L) $5x + 6y = -11$
$3x + y = -4$ (-1, -1)

TWEET	(1, 2)
HIS	(2, 1)
SELLING	(−5, 0)
BIRDSEED	(−1, −2)
UDDER	(2, 0)
THE	(2, 3)
SINGING	(−5, 4)
STARTED	(2, −2)
FED	(−2, 4)
BUTTER	(−1, 3)
COWS	(1, 4)
MILK	(−1, −1)
FARMER	(1, −2)
AND	(0, 3)
WINGS	(2, −4)
WHO	(1, −4)
MOO	(1, 3)
CHEEP	(5, 2)
BEEF	(3, −2)

OBJECTIVE 6-f: To solve systems of equations using multiplication with the addition method (equations are in standard form).

$5x - 2y = 4$

$3x + y = 9 \;]\; 2$

$6x + 2y = 18$ $\quad 6(2) + 2y = 18$

$11x = 22$ $\quad 2y = 6$

$x = 2$ $\quad y = 3$

$7x - 3y = -5 \;]\; 2$

$3x + 2y = 11 \;]\; 3$

$14x - 6y = -10$

$9x + 6y = 33$ $\quad -9 + 6y = 33$

$23x = 23$ $\quad 6y = 42$

$x = 1$ $\quad y = 7$

$3x - 5y = 13$

$x - 2y = 5 \;]\; -3$

$-3x + 6y = -15$ $\quad -3x + 6(-2) = -15$

$y = -2$ $\quad -3x = -3$

$x = 1$

$3x - 5y = 7 \;]\; 2$

$5x - 2y = -1 \;]\; -5$

$6x - 10y = 14$ $\quad 6 - 10y = 14$

$-25x + 10y = 5$ $\quad -10y = 20$

$-19x = 19$ $\quad y = -2$

$x = -1$

$7x + 2y = -1 \;]\; 2$

$3x - 4y = 19$

$14x + 4y = -2$ $\quad 14 + 4y = -2$

$17x = 17$ $\quad 4y = -16$

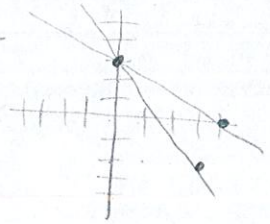
$x = 1$ $\quad y = -4$

$4x + 3y = 9$ $\quad 3y = -4x + 9$

$3x + 4y = 12$ $\quad y = -\frac{4}{3}x + 3$

$3x + 4\left(-\frac{4}{3}x + 3\right) = 12$

$\frac{9}{3}x - \frac{16}{3}x + 12 = 12$



$-x + 2y = 6 \;]\; -5$

$5x + 2y = 2$ $\quad 5x + 12 = 2$

$-5x - 10y = -30$ $\quad 5y = 10$

$-7y = -28$ $\quad x = -2$

$y = 4$

$5x - 3y = 16 \;]\; 5$

$4x + 5y = -2 \;]\; 3$

$25x - 15y = 80$ $\quad 50 - 15y = 80$

$12x + 15y = -6$ $\quad -15y = 30$

$37x = 74$ $\quad y = -2$

$x = 2$

$3[2x + 3y = 7$

$-2[3x + 4y = 10$ $\quad 6x + 9y = 21$

$-6x - 8y = -20$

$6x + 9 = 21$

$6x = 12$

$x = 2$

$y = 1$

Name: KEY - WALSH

Date: _____ Class: support

Writing Systems from Word Problems Practice

1. A sporting good store sells right-handed and left-handed baseball gloves. In one month 12 gloves were sold for a total revenue of $528. Right-handed gloves cost $48 and left-handed gloves cost $36. How many of each type of glove was sold.

x = # of right handed glove
y = # of left handed glove

$x + y = 12$
$48x + 36y = 528$

$-48x - 48y = -576$
$48x + 36y = 528$
$-12y = -48$
$y = 4$

$x + y = 12$
$x + 4 = 12$
$x = 8$

2. For a community bake sale, you purchases 12 pounds of sugar and 15 pounds of flour. Your total cost was $9.30. The next day, you purchased 4 pounds of sugar and 10 pounds of flour. Your total cost the second day was $4.60. Find the cost of a pound of sugar and a pound of flour.

x = $ sugar
y = $ flour

$12x + 15y = 9.80$
$-3[4x + 10y = 4.60]$
$-12x - 30y = -13.8$
$-15y = -4.5$
$y = \$0.30$

$12x + 15y = 9.30$
$12x + 15(.20) = 9.30$
$12x + 4.5 = 9.30$
$12x = 4.8$
$x = \$0.40$

3. Radio Tower had a special on rechargeable batteries. It sold AA for $1 and AAA for $0.75. It sold 42 batteries on a single day and received $37. How many batteries and of which type were sold?

x = # of AA batteries
y = # of AAA batteries

$-1[x + y = 42]$
$x + .75y = 37$
$-x - y = -42$
$-.25y = -5$
$y = 20$

$x + 20 = 42$
$x = 22$

4. Elisa and Stefan each improved their yards by planting daylilies and ivy. They bought their supplies from the same store. Elisa spent $96 on 14 daylilies and 3 pots of ivy. Stefan spent $104 on 16 daylilies and 2 pots of ivy. Find the cost of one daylily and the cost of one pot of ivy.

x = # daylilies
y = # ivy

$14x + 3y = 96] -2$
$16x + 2y = 104] 3$

$-28x - 6y = -192$
$48x + 6y = 312$
$20x = 120$
$x = 6$

$14x + 3y = 96$
$14(6) + 3y = 96$
$84 + 3y = 96$
$3y = 12$
$y = 4$

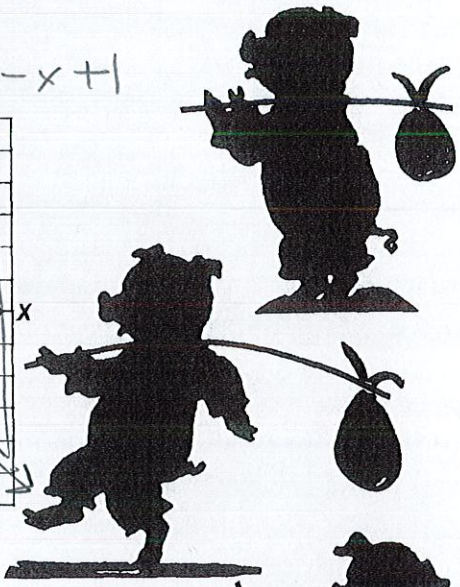
5. The sum of two numbers is 47, and their difference is 15. What is the value of the smaller and larger number?

$x + y = 47$
$+ \; x - y = 15$
$2x = 62$
$x = 31$

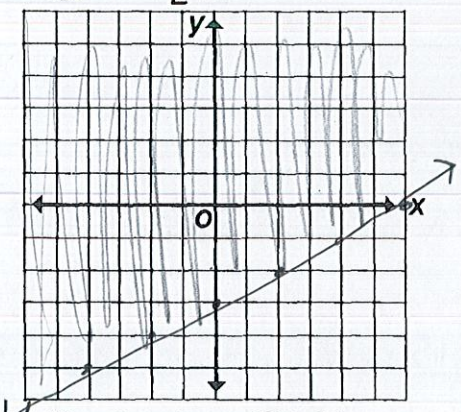
$x + y = 47$
$31 + y = 47$
$y = 16$

Why Did the Three Pigs Leave Home?

Graph each inequality below. Circle the letter of the statement that correctly describes the location of the graph. Print this letter in each box at the bottom of page 31 that contains the number of the exercise.



1 $y \geq \frac{1}{2}x - 3$

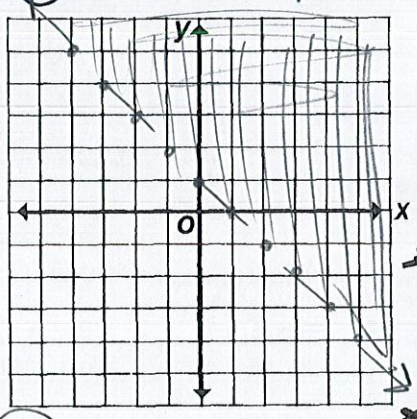


D Quadrants I, II, IV; includes boundary line.

E All four quadrants; includes boundary line.

I Quadrants I, III, IV; excludes boundary line.

2 $x + y > 1$ $y > -x + 1$

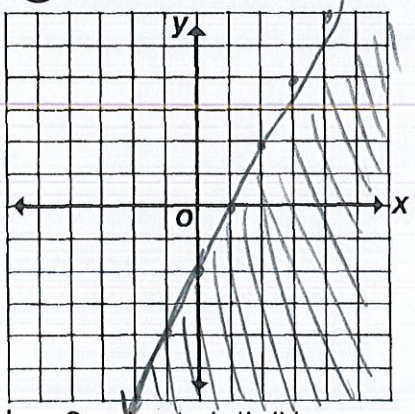


S Quadrants I, II, IV; excludes boundary line.

B All four quadrants; includes boundary line.

F Quadrants I, III, IV; excludes boundary line.

3 $y \leq 2x - 2$

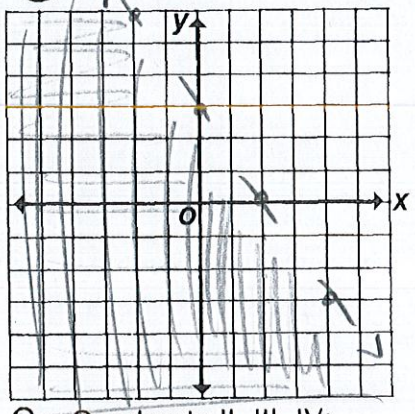


L Quadrants I, II, IV; includes boundary line.

T Quadrants I, III, IV; includes boundary line.

V All four quadrants; excludes boundary line.

4 $3x + 2y < 6$ $y < -\frac{3}{2} + 3$

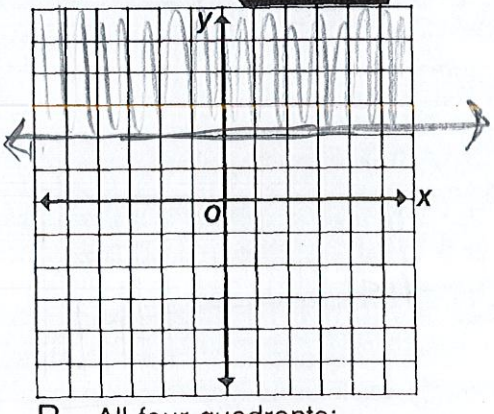


C Quadrants II, III, IV; excludes boundary line.

M Quadrants I, II, IV; includes boundary line.

O All four quadrants; excludes boundary line.

5 $y \geq 2$



R All four quadrants; excludes boundary line.

U Quadrants II, III; includes boundary line.

H Quadrants I, II; includes boundary line.

$-3y \leq -2x + 12$

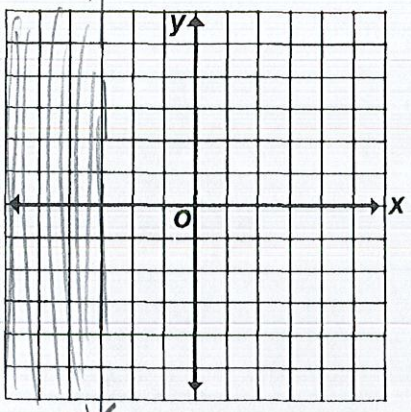
$y \geq \frac{2}{3}x - 4$

$4x + 3y < 6$

$3y < -4x + 6$

$y < -\frac{4}{3}x + 2$

(6) $x < -3$

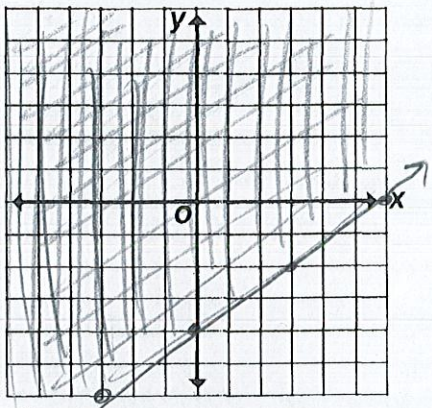


L Quadrants I, II; excludes boundary line.

W Quadrants II, III; excludes boundary line.

G Quadrants I, III; excludes boundary line.

(7) $2x - 3y \leq 12$

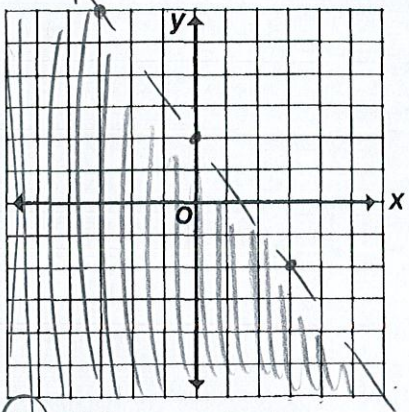


K Quadrants I, III, IV; excludes boundary line.

U Quadrants II, III, IV; includes boundary line.

I All four quadrants; includes boundary line.

(8) $5x + 3y < x + 6$



F All four quadrants; excludes boundary line.

P Quadrants I, II, III; excludes boundary line.

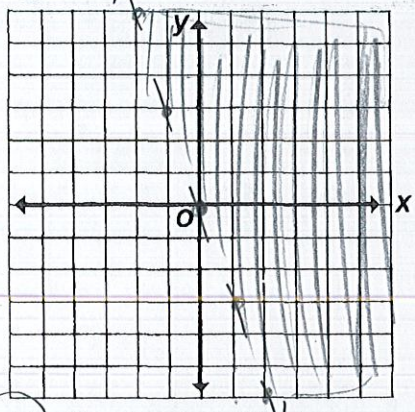
M Quadrants I, III, IV; excludes boundary line.

$y > -3x$

$2x - 2y \geq 5$

$5y \geq 3x - 5$

(9) $3x + y > 0$

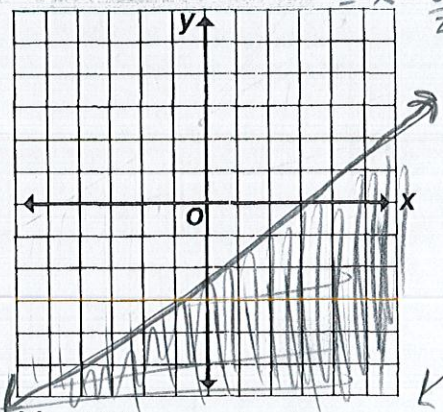


R Quadrants I, II, IV; excludes boundary line.

L All four quadrants; includes boundary line.

M Quadrants I, III, IV; excludes boundary line.

(10) $2(x - y) \geq 5$ $-2y \geq -2x + 5$ $\leq x - \frac{5}{2}$

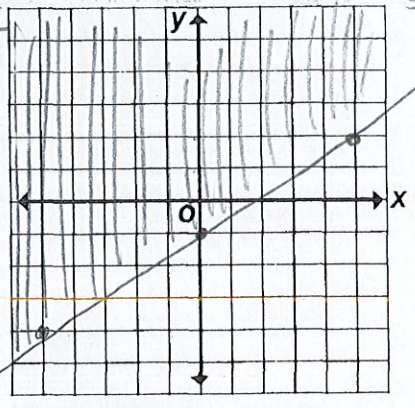


Y All four quadrants; excludes boundary line.

U Quadrants II, III, IV; includes boundary line.

A Quadrants I, III, IV; includes boundary line.

(11) $5y - 2 \geq 3x - 7$ $y \geq \frac{3}{5}x - 1$



N Quadrants I, III, IV; excludes boundary line.

B All four quadrants; includes boundary line.

D Quadrants I, II, IV; includes boundary line.

3	5	1	7	9	8	10	3	5	1	9	6	10	2	10	11	4	10	9
T	H	E	I	R	F	A	T	H	E	R	W	A	S	A	B	O	A	R

THEIR FATHER WAS A BOAR