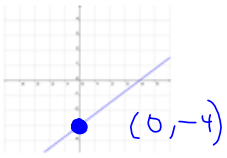
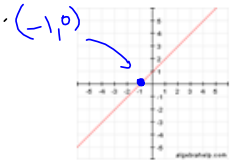
Algebra 1 – WH

Skills PreTest: 5-3

1. Place a dot at the y-intercept on the following graph:



2. Place a dot at the x-intercept on the following graph:



3. The x-coordinate of the y-intercept is always 0.

4. The y-coordinate of the x-intercept is always 0.

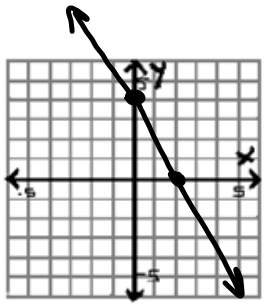
5. Graph using the x- and y-intercepts.

$2x + y = 4$

x	y
0	4
2	0

y int → (0, 4)

x int → (2, 0)



$2(0) + y = 4$

$2x + 0 = 4$

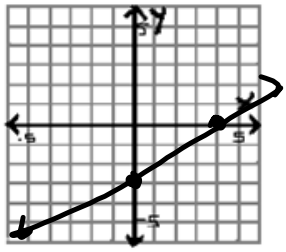
$2x = 4$

$x = 2$

6. Graph using the x- and y-intercepts.

$3x - 4y = 12$

x	y
0	-3
4	0



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5–3 Standard Form

Vocabulary:

The standard form of a linear equation is where A, B, and C are real numbers and A and B are not zero.

$Ax + By = C$ Example: $2x + 3y = 6$

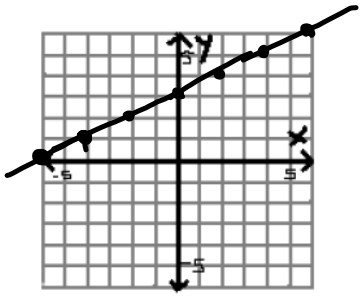
Investigating Standard Form:

1. Graph the equation $-2x + 4y = 12$ by making a table of values for the domain $\{-6, -4, -2, 0, 2, 4, 6\}$

x-int

y-int

X	-2x + 4y = 12	Y
-6	-2(-6) + 4y = 12	0
-4	-2(-4) + 4y = 12	1
-2	-2(-2) + 4y = 12	2
0	-2(0) + 4y = 12	3
2	-2(2) + 4y = 12	4
4	-2(4) + 4y = 12	5
6	-2(6) + 4y = 12	6



2. What is the y–intercept on the graph? (0,3)

3. What is the x–intercept on the graph? (-6,0)

4. Check the table above, are the x and y intercept on the table?

What do all y-intercepts have? zero for the x-value

What do all x-intercepts have? zero for the y-value

5. Try substituting $y = 0$ into the original equation. What do you get for x?

$-2x + 4(0) = 12$

$-2x = 12$

$x = -6$

6. Explain how you could use algebra to find where the line will intercept both axis without having to make a table.

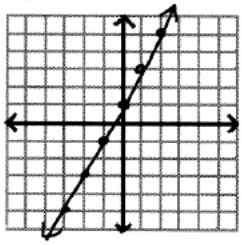
Substitute a zero for x, and solve for y. Then substitute a zero for y and solve for x.

Check your homework solutions. Any questions?

1. $y - 1 = 2x$

$+1$

$y = 2x + 1$

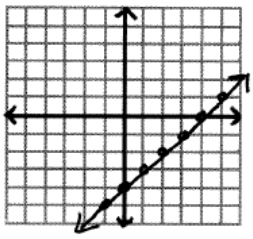


5. $8x - 8y = 32$

$-8x$

$\frac{-8y}{-8} = \frac{-8x}{-8} + \frac{32}{-8}$

$y = x - 4$

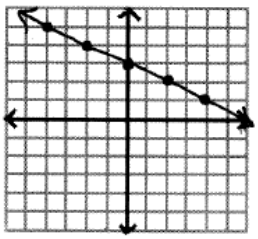


9. $6y - 18 = -3x$

$+18$

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

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



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Example 1: Finding x– and y–intercepts

Find the x– and y–intercepts of :

$-2x + 4y = 8$

Step 1: Substitute zero for x and solve for y.

$-2(0) + 4y = 8$

$4y = 8$

$y = 2$

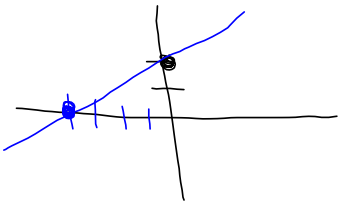
Step 2: Substitute zero for y and solve for x.

$-2x + 4(0) = 8$

$-2x = 8$

$x = -4$

x	y
0	2
-4	0



√ Understanding Check:

Find the x– and y–intercept of :

a. $3x - 2y = 18$

$3(0) - 2y = 18$

$-2y = 18$

$y = -9$

$3x - 2(0) = 18$

$3x = 18$

$x = 6$

x	y
0	-9
6	0

b. $4x - 6y = -12$

x	y
0	2
-3	0

Shortcut (The cover up method):

Cover up the variable and coefficient that is being substituted with your finger to show that part "zeroing out". Solve the remaining equation.

Use the cover-up method to find the x– and y–intercept of :

Watch out for tricks!

a. $5x - 3y = -30$

x	y
0	10
-6	0

b. $-2x - 7y = 28$

x	y
0	-4
-14	0

c. $-3x + 9y = -18$

x	y
0	-2
6	0

d. $2x + 6y - 24 = 0$

x	y
0	4
12	0

$2x + 6y = 24$

Example 2: Graphing Lines Using Intercepts

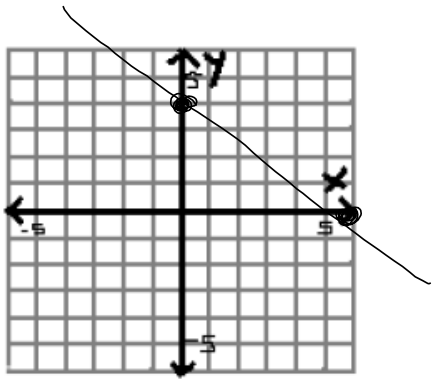
Graph $2x + 3y = 12$

Step 1: Substitute zero for x and solve for y.

Step 2: Substitute zero for y and solve for x.

Step 3: Draw the line.

x	y
0	4
6	0



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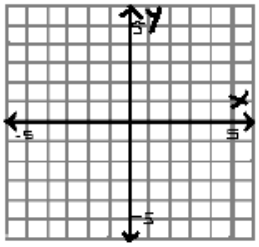
√ Understanding Check:

Graph using the x– and y–intercepts.

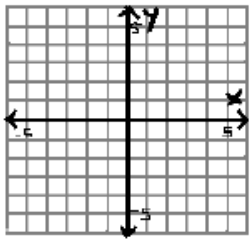
a. $5x + 2y = -10$

x	y



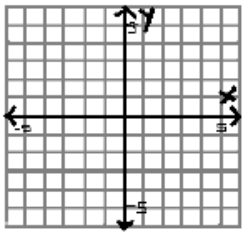
b. $-2x - 4y = -8$

x	y



c. $16x - 8y = 48$

x	y

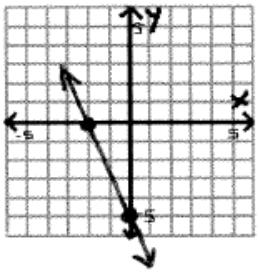


√ Understanding Check:

Graph using the x– and y–intercepts.

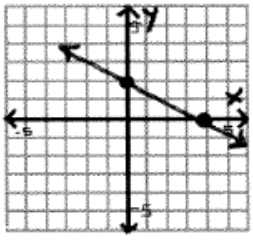
a. $5x + 2y = -10$

x	y
0	-5
-2	0



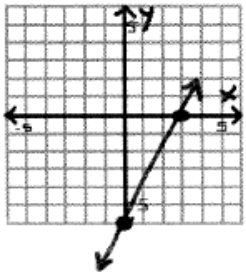
b. $-2x - 4y = -8$

x	y
0	2
4	0



c. $16x - 8y = 48$

x	y
0	-6
3	0



Activity by a 150 lb Person	Calories Burned per Minute
~~Bowling~~	~~3~~
~~Walking~~	~~5~~
~~Jogging~~	~~7~~
Bicycling	10
Swimming	11
~~Running~~	~~15~~

Example 4: Application: Why would a line ever be in standard form?

Use the table to ~~write an equation~~ in standard form to find the number of minutes a 150 lb person would need to bicycle and swim laps in order to burn 300 calories.

Define:
Let x = time to bicycling
Let y = time to swim

Write: $10x + 11y = 300$

$10x + 11y = 300$

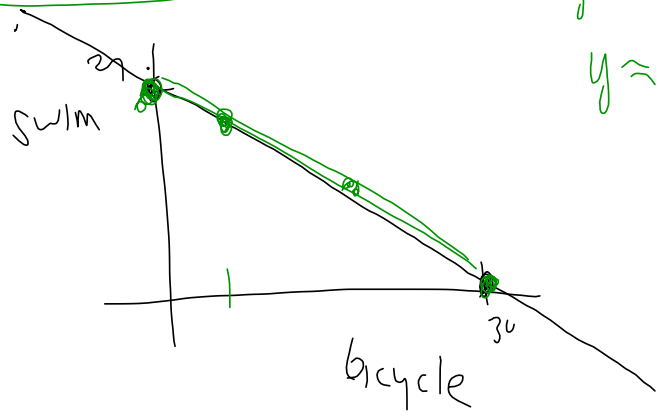
$40(5) + 11y = 300$

$11y = 250$

$y = \frac{250}{11}$

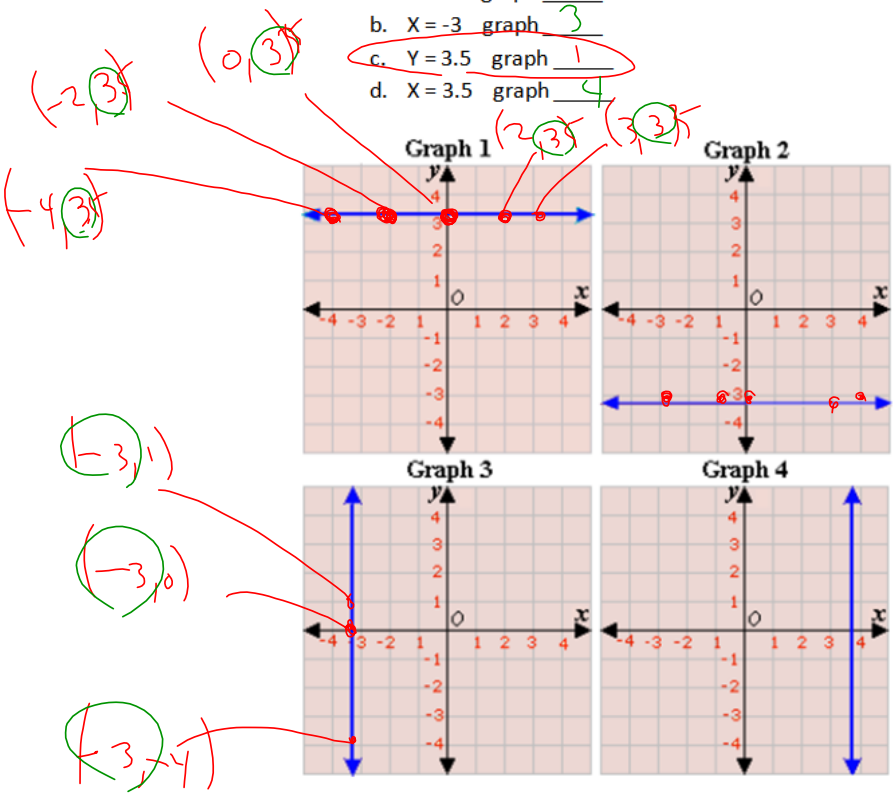
$y \approx 22.7$

x	y
0	$\frac{300}{11} \approx 27$
30	0
5	22.7



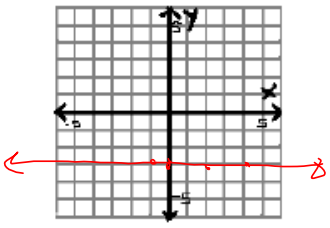
7. Matching the equation to the graph:

a. Y = -3 graph 2
b. X = -3 graph 3
c. Y = 3.5 graph 1
d. X = 3.5 graph 4

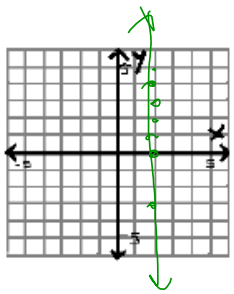


Example 3: Graphing Horizontal and Vertical Lines

a. Graph y = –3



b. Graph x = 2



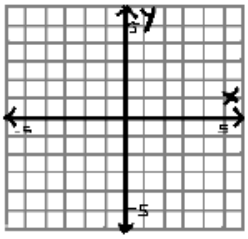
All equations with only a y variable will graph as a horizontal line.

All equations with only an x variable will graph as a vertical line.

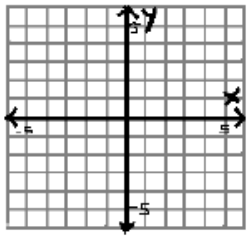
√ Understanding Check:

Graph each equation.

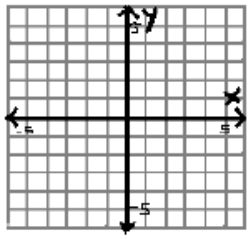
a. y = 2



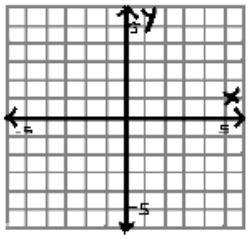
b. x = - 4



c. y = -5



d. x = 1

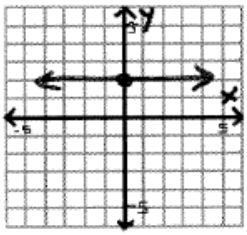


answers

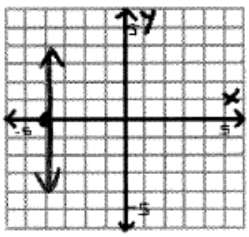
√ Understanding Check:

Graph each equation.

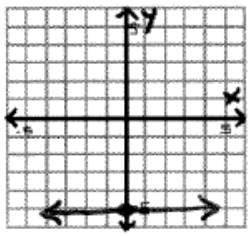
a. y = 2



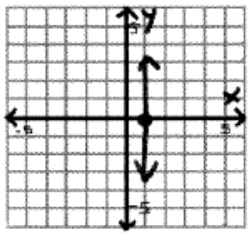
b. x = - 4



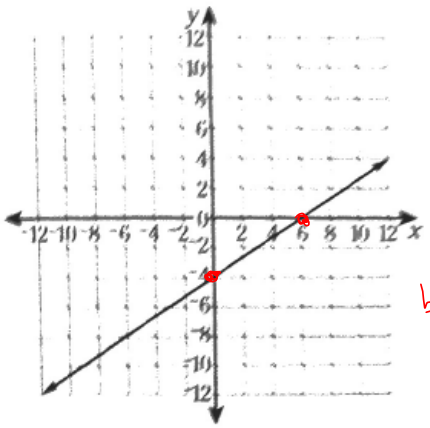
c. y = -5



d. x = 1



1. A graph of a linear equation is shown below.



b = -4
m = 2/3

Which equation describes the graph?

A $y = \frac{3}{2}x + 4$

B $y = \frac{2}{3}x + 4$

C $y = \frac{3}{2}x - 4$

D $y = \frac{2}{3}x - 4$

2. Which statement is true of the equation below?

$$y - 6 = -3(x + 1)$$

A The slope is 3 and the *y*-intercept is 1.

B The slope is 3 and the *y*-intercept is -6.

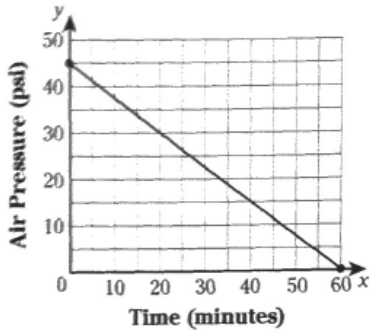
C The slope is -3 and the *y*-intercept is 1.

D The slope is -3 and the *y*-intercept is 3.

$y - 6 = -3x - 3$

$y = -3x + 3$

3. The air pressure in a tire is 45 pounds per square inch (psi). Air is released at a constant rate until the tire is deflated. The graph below shows the air pressure (y) in the tire after x minutes.



Which of these equations represents the relationship between time and the air pressure?

A $y = \frac{3}{4}x + 45$

B $y = \frac{3}{4}x - 45$

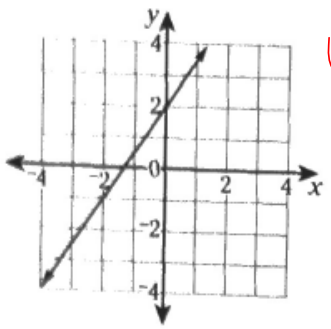
C $y = -\frac{3}{4}x + 45$

D $y = -\frac{3}{4}x - 45$

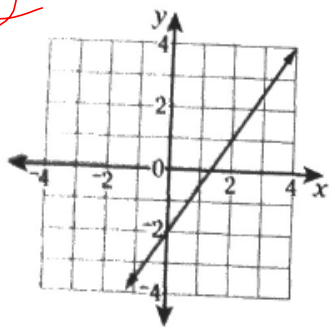
4. Which graph shows the line $y + 2 = \frac{3}{2}x$?

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

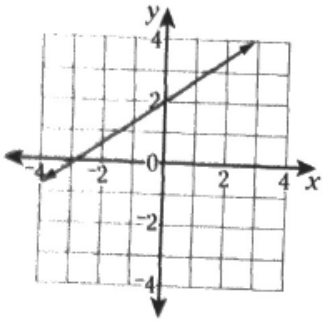
A



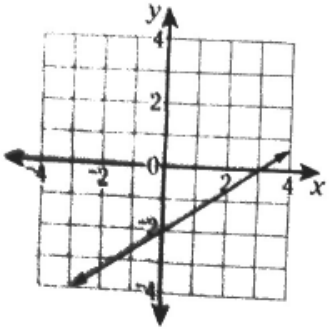
C



B



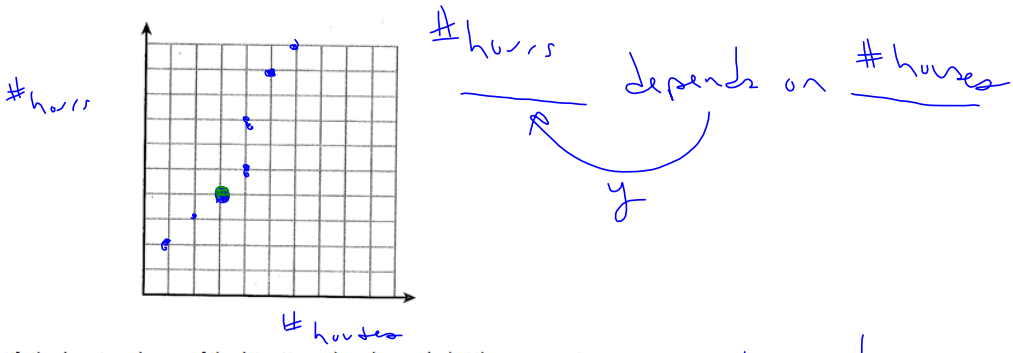
D



During the summer, Bonnie cleans houses to earn money. She keeps track of the number of houses that she cleans and how many hours it takes her each day for seven days. The table below shows her data for one week.

# of houses	3	4	1	5	4	2	6
hours	4	6	2	8	5	3	9

A. Graph the points from the table above. Label each axis.



B. Identify the domain and range of the data. Name the values and what they represent.

Domain: {1, 2, 3, 4, 5, 6} ← # houses cleaned

Range: {2, 3, 4, 5, 6, 8, 9} ← # hours worked

C. Explain how you know whether or not this relation is a function.

It's not a function becasue 4 is mapped to two different values.

Kate is going to solve the inequality shown below. In the inequality, e represents the # of eggs that Kate's chicken coup produces every day.

$$8 + |4e - 7| \geq 17$$

a) Solve the inequality and show your work.

b) Graph the solution to the inequality on this number line.

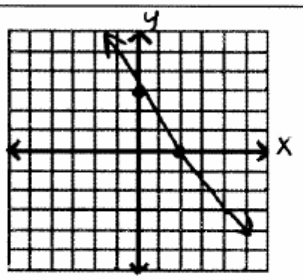
c) Kate says that e = -1 is a reasonable solution to the inequality. Explain why Kate thinks that, but also explain why she is incorrect in this situation.

Homework:

HW page 51 all

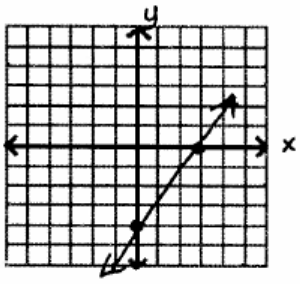
1. $3x + 2y = 6$

x	y
0	3
2	0



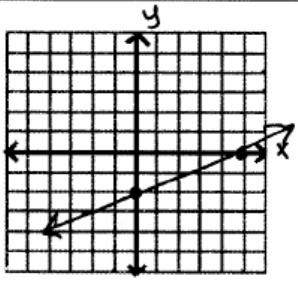
2. $4x - 3y = 12$

x	y
0	-4
3	0



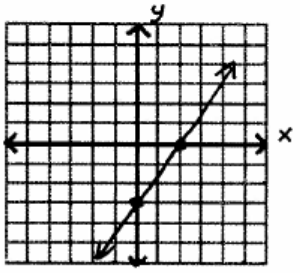
3. $-2x + 5y = -10$

x	y
0	-2
5	0



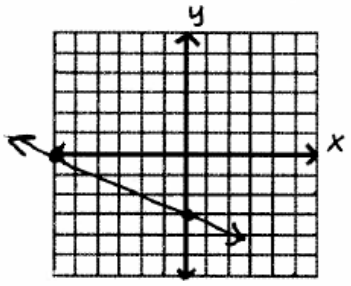
4. $3x - 2y = 6$

x	y
0	-3
2	0



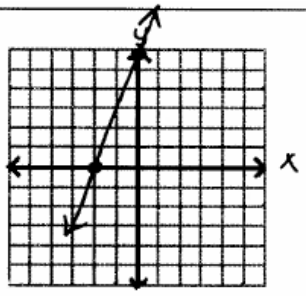
5. $-x - 2y = 6$

x	y
0	-3
-6	0



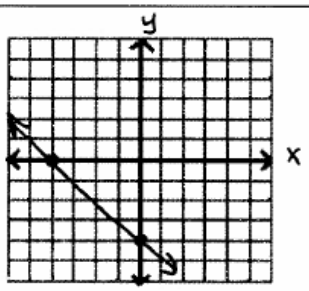
6. $3x - y = -6$

x	y
0	6
-2	0



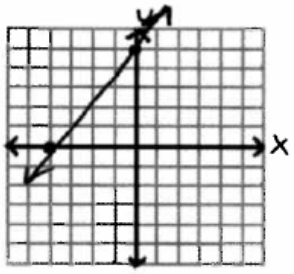
7. $x + y = -4$

x	y
0	-4
-4	0



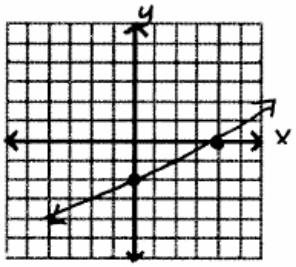
8. $5x - 4y = -20$

x	y
0	5
-4	0



9. $20x - 40y = 80$

x	y
0	-2
4	0



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

x	y
0	-4
2	0