4.2

Algebra 2

Graphs of Linear Functions

slope-intercept form of a line:

$$y = mx + b$$

m = slope b = y-intercept

To graph a line using slope-intercept form:

1. Solve for y if needed
2. Plot your y-intercept using you b
3. change your slope into rise over run
4. go up or down using the top number, go left or righ
   using the bottom number.

ex. $3x - y = 15$

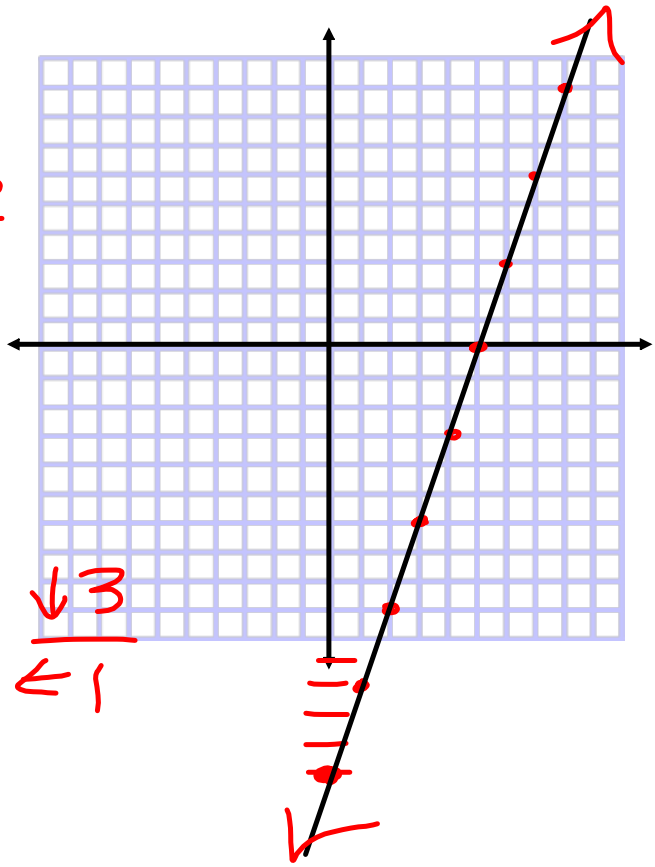
$-3x \qquad -3x$

$\frac{-y}{-1} = \frac{-3x}{-1} + \frac{15}{-1}$

$y = 3x - 15$

$b = -15$

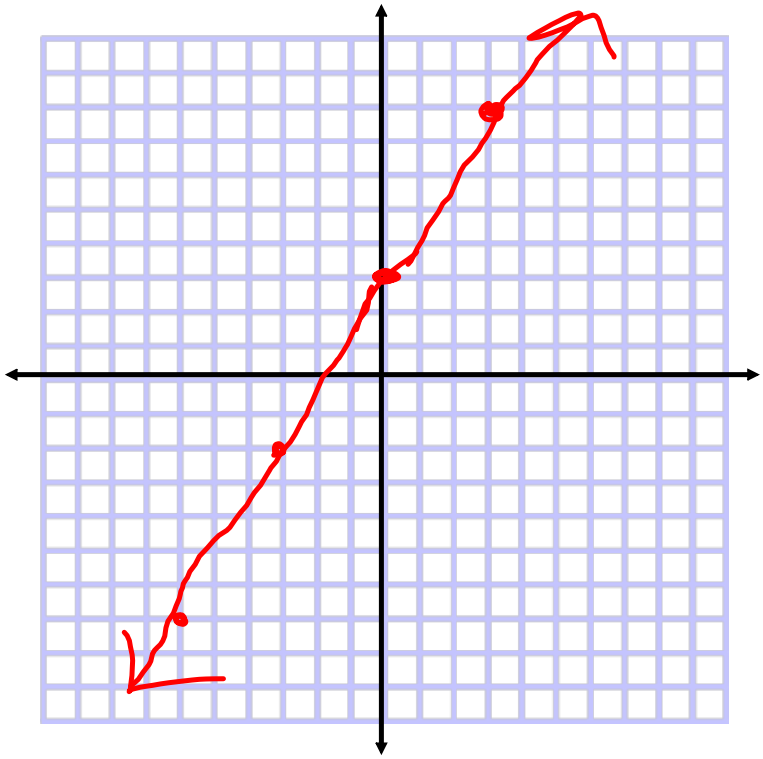
$m = \frac{3}{1} \quad \frac{\uparrow 3}{\rightarrow 1} \quad \frac{\downarrow 3}{\leftarrow 1}$



Try this:

Graph using slope-intercept form

$$3y - 5x = 9$$
$$+5x \qquad +5x$$
$$\frac{3y}{3} = \frac{5x}{3} + \frac{9}{3}$$
$$y = \frac{5}{3}x + 3$$

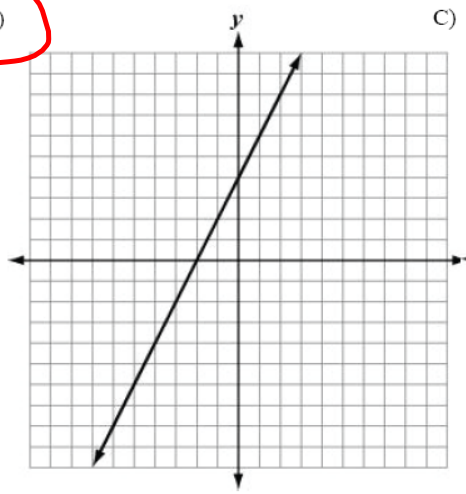


Which graph represents the same pattern as $4x - 2y = -8$?

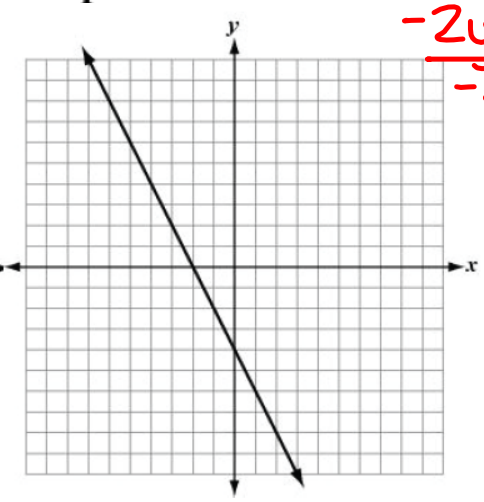
$\frac{-2y = -4x - 8}{-2 \quad -2 \quad -2}$

$y = 2x + 4$

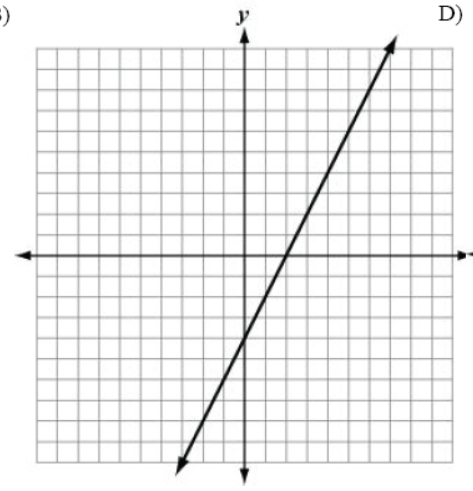
A)



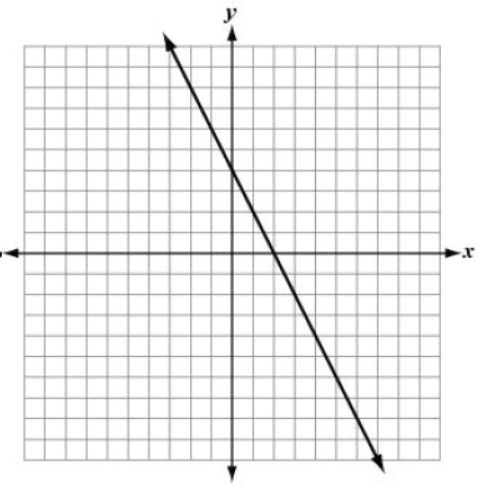
C)



B)



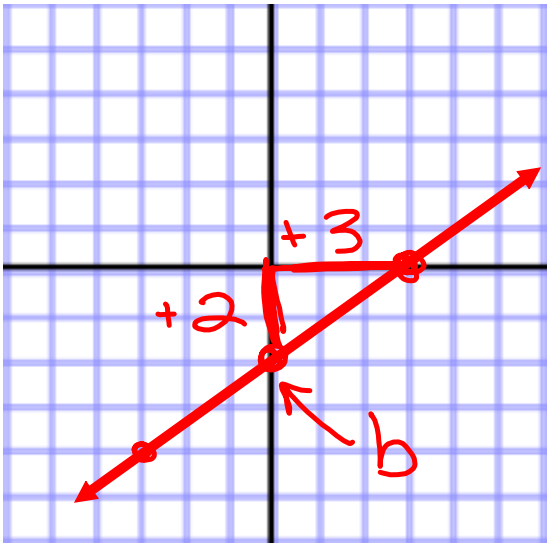
D)



Write the equation of the line in slope-intercept form given its graph.

Hint:

1. Find it's slope
2. Find it's y-intercept or another point on the line
3. Put the slope and y-intercept or point into slope-intercept form or point-slope form.

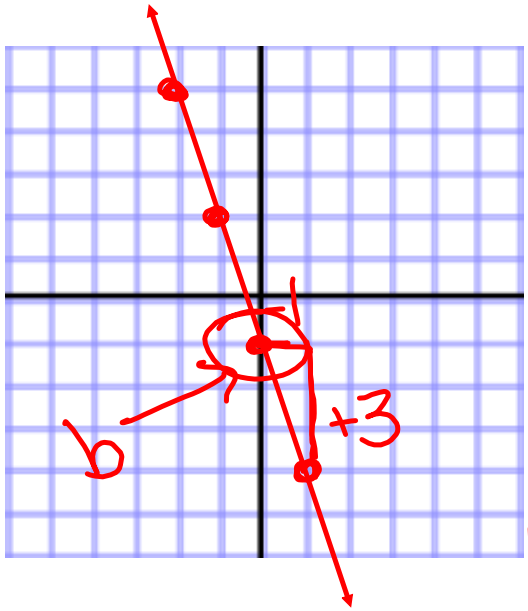


$\frac{\text{rise } 2}{\text{run } 3} = \frac{2}{3} = m$

$b = y\text{-intercept} = -2$

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

Write the equation of the line in slope-intercept form given it's graph.



$m = \frac{\text{rise}}{\text{run}} = \frac{3}{-1} = -3$

$b = -1$

$y = -3x - 1$

Given the table of values write the equation of the line.

x	y
-3	1
-2	3
-1	5
0	7
1	9
2	11
3	13

$f(x) = 2x + 7$

+2 (1,9) (-1,5)

$m = \frac{5-9}{-1-1} = \frac{-4}{-2} = 2$

$\frac{2}{1} = 2 = m$

y-int = (0,7)

$b = 7$ (0, y) $b = 7$

$y = 2x + 7$

$y = 2x + 7$

Given the table of values write the equation of the line.

x	y
-3	5/2
-2	2
-1	3/2
0	1
1	1/2
2	0
3	-1/2

$f(x) = -(1/2)x + 1$

$(-2, 2)\ (2, 0)$

$\frac{0-2}{2+2} = \frac{-2}{4} = -\frac{1}{2}$

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

Practice Problems

Worksheet

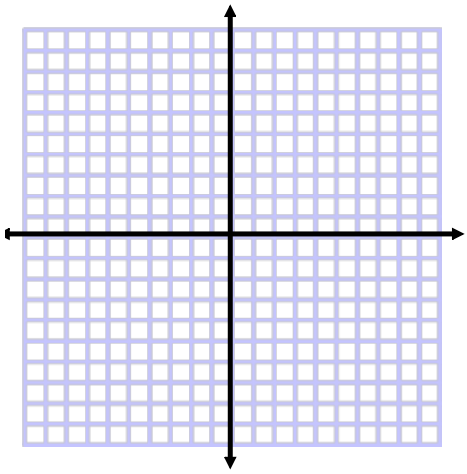
Algebra 2

4.2 Graphs of Linear Functions

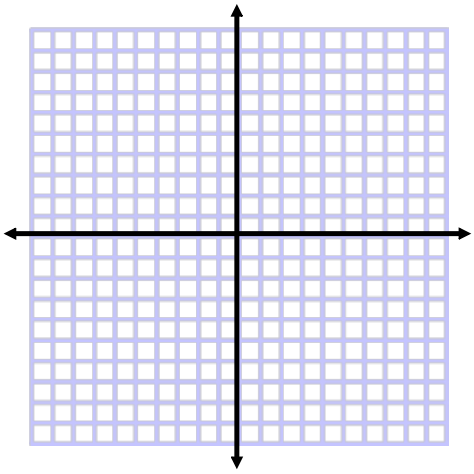
Name: _____ Date: _____ Hr: __

Graph using slope-intercept form.

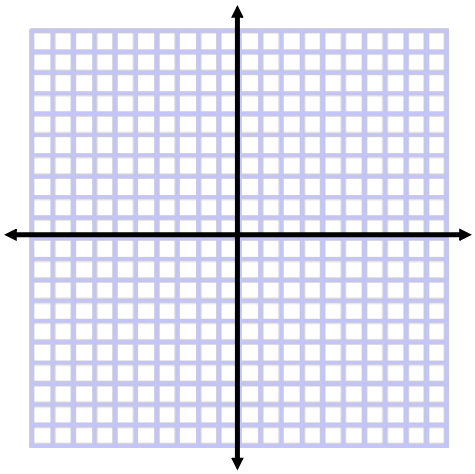
1. $x - 2y + 2 = 0$



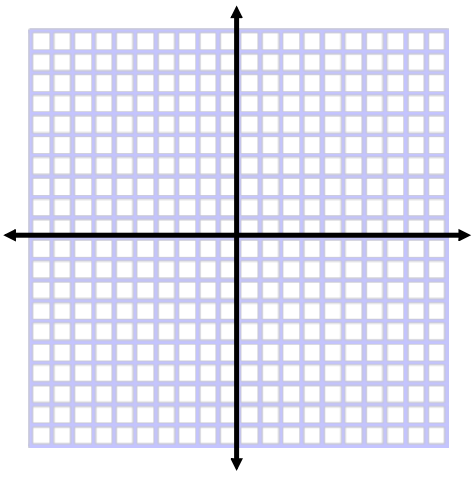
2. $12x - 8y = -24$



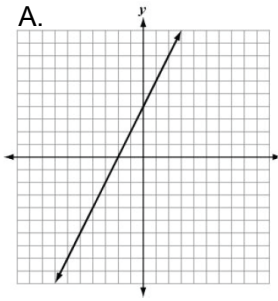
3. $2y = -5x - 4$

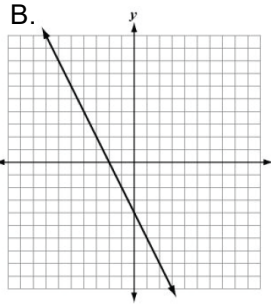


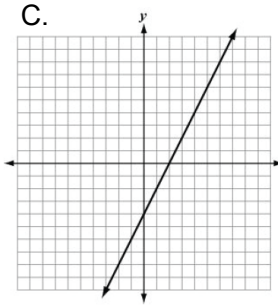
4. $2x + y = -3$

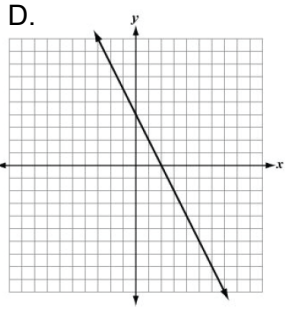


5. Which graph represents the same patter as 4x - 2y = -8?

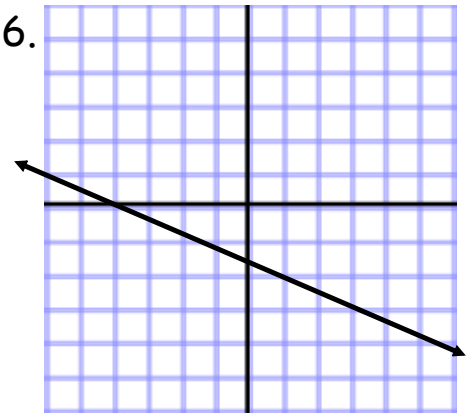
A. 

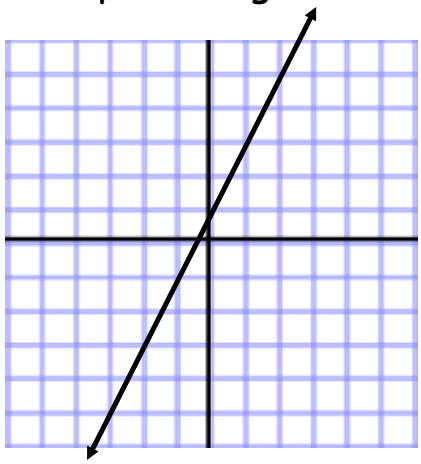
B. 

C. 

D. 

Write the equation of the line in slope-intercept form given it's graph.

6. 

7. 

Given the table of values write the equation of the line.

8.

x	y
-3	8
-2	5
-1	2
0	-1
1	-4
2	-7
3	-10

9.

x	y
-3	3/2
-2	2
-1	5/2
0	3
1	7/2
2	4
3	9/2