

**Warm Up**

9/20

Notebook Check



Google Classroom

Check Classroom for Notebook Check assignments.

What 2 pieces of information do we need to write an equation of a line?



$$\text{Slope} = \frac{\Delta y}{\Delta x}$$

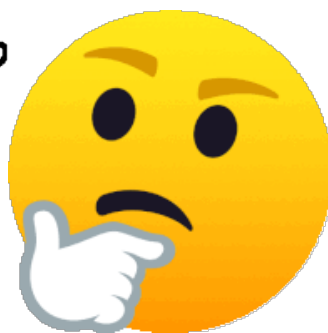
y-int

- Where the line crosses the y-axis
- the value of  $y$  when  $x=0$

Why is this called  
the **Slope Intercept**  
form of a linear  
equation?

$$y = mx + b$$

slope                  y-int

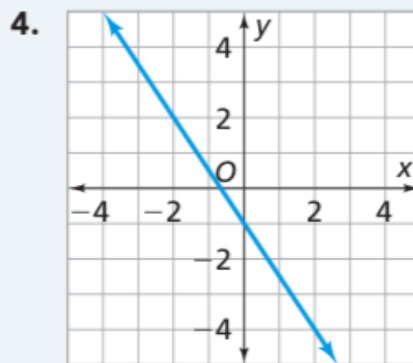
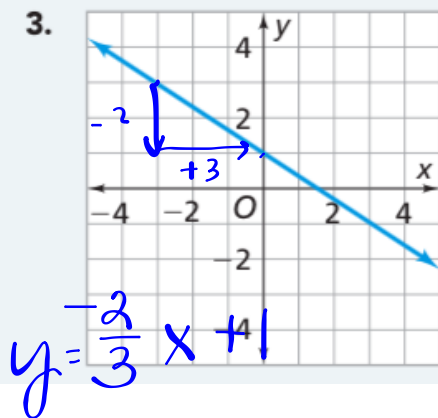
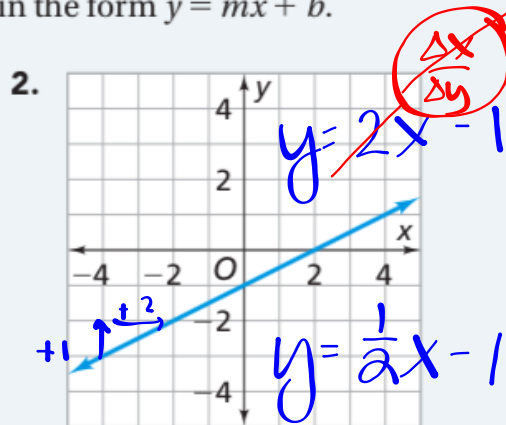
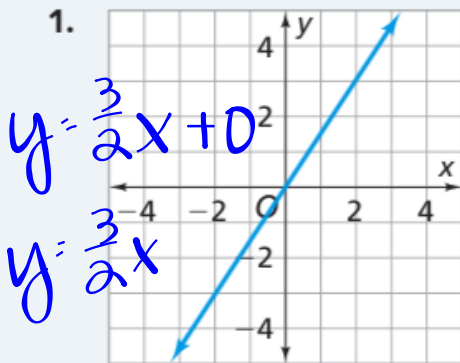


THEY ARE IN YOUR FACE!

## Problem 2.2

Use the data given in each question to find the equation of the linear function relating  $y$  and  $x$ .

- A** For the functions with the graphs below, find the slope and  $y$ -intercept. Then write the equations for the lines in the form  $y = mx + b$ .



Handwritten equations for graph 4:

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

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

- B** 1. Find equations for the linear functions that give these tables. Write them in the form  $y = mx + b$ .

a.

x	-2	-1	0	1	2
y	-1	1	3	5	7

$\frac{\Delta y}{\Delta x} = \frac{2}{1}$   
 $y = 2x + 3$   
 y-int  
 Value of y when x=0

b.

x	-6	-2	2	6	10
y	-4	-2	0	2	4

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

2. For each table, find the unit rate of change of y compared to x.  
 3. Does the line represented by this table have a slope that is greater than or less than the equations you found in part 1(a) and part 1(b)?

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

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

Slopes =  $\frac{1}{2}$ , 2, -3

greatest slope  
 It is the steepest!

# Quick and easy way to graph a line from an equation -

Using the slope intercept form of the equation, we already have:

**Slope**

**y-intercept**

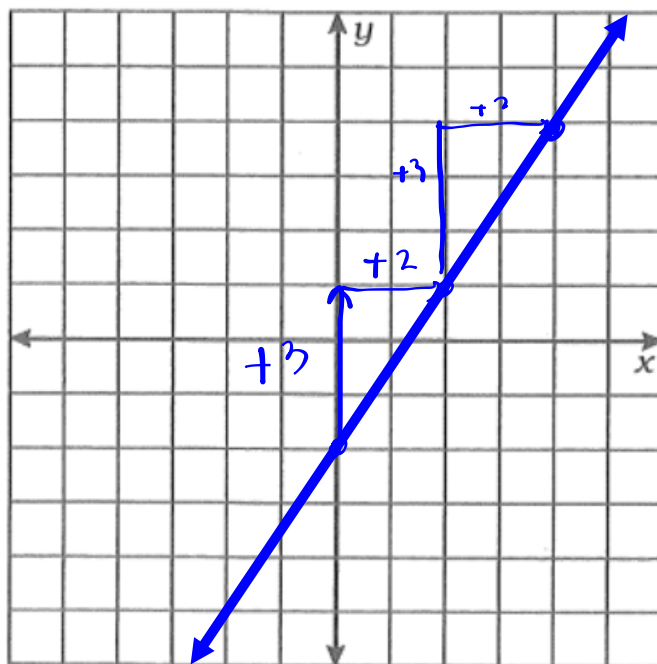
And we know:

$$\text{Slope} = \frac{\Delta y}{\Delta x}$$

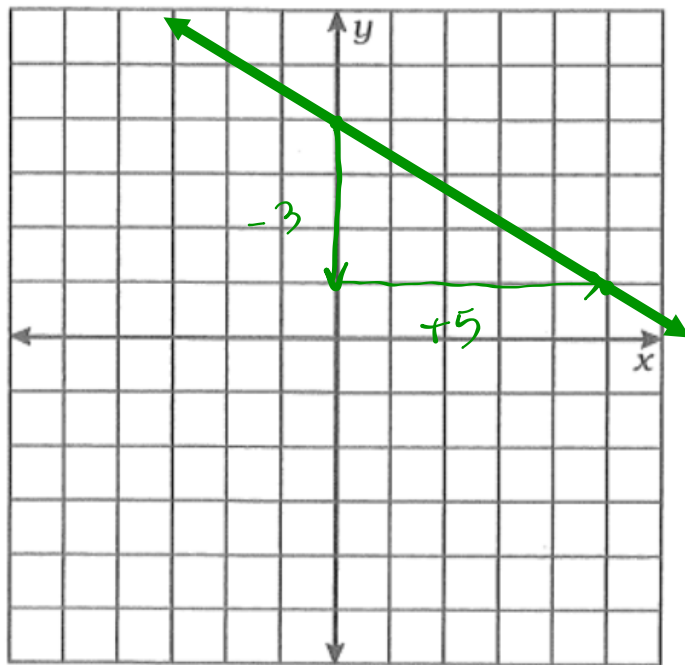
## How to graph using this info

We can **plot the y-intercept** and then using the **slope**, count our way to the next point on the line.

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



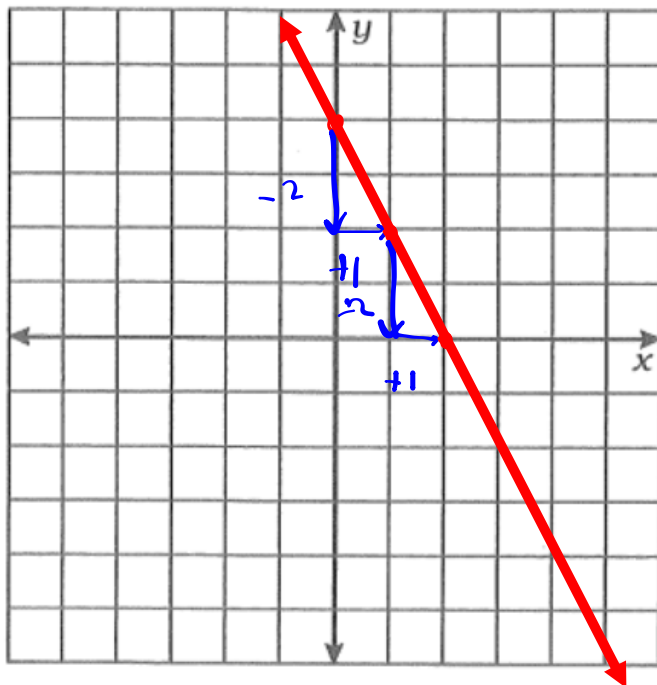
$$y = -\frac{3}{5}x + 4$$



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



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



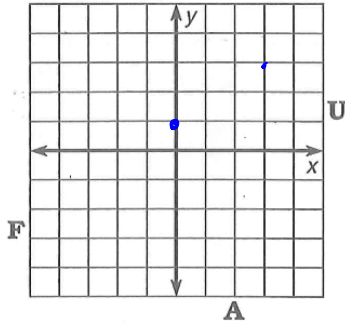
$$\frac{\Delta y}{\Delta x} = \frac{-2}{1}$$

# What Happened to the Little Boy Who Swallowed a Silver Dollar?

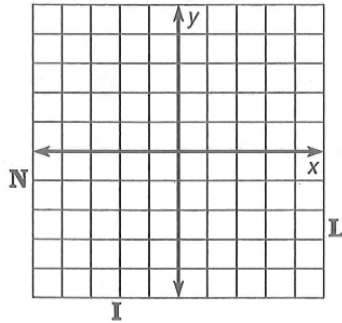


Use the slope and y-intercept to graph each equation. The graph, if extended, will cross a letter outside the grid. Look for this letter in the string of letters at the bottom of the page and cross it out each time it appears. When you finish, write the remaining letters in the rectangle at the bottom of the page.

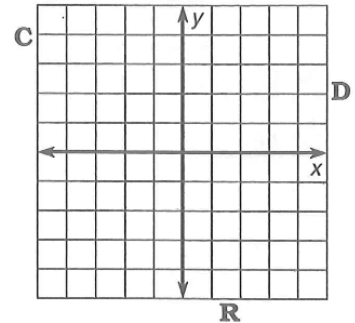
1  $y = \frac{2}{3}x + 1$



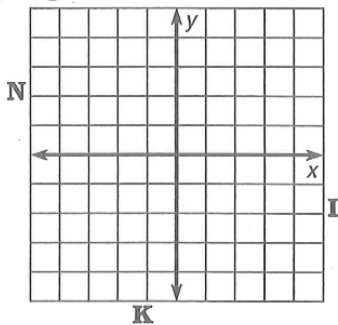
2  $y = -\frac{2}{3}x + 1$



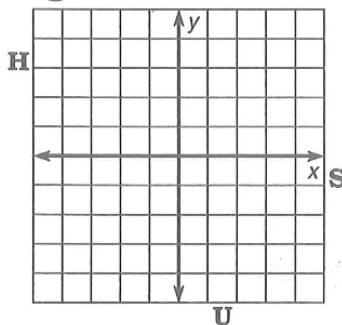
3  $y = \frac{3}{4}x - 2$



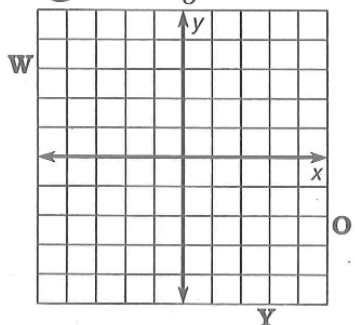
4  $y = 2x - 3$



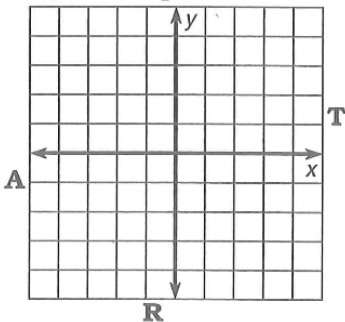
5  $y = -3x - 1$



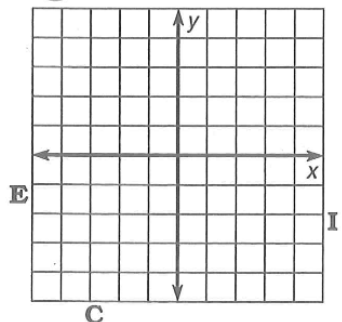
6  $y = -\frac{1}{5}x + 2$



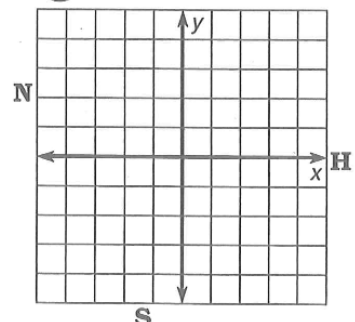
7  $y = \frac{7}{4}x - 4$



8  $y = -x + 3$



9  $y = 4x$



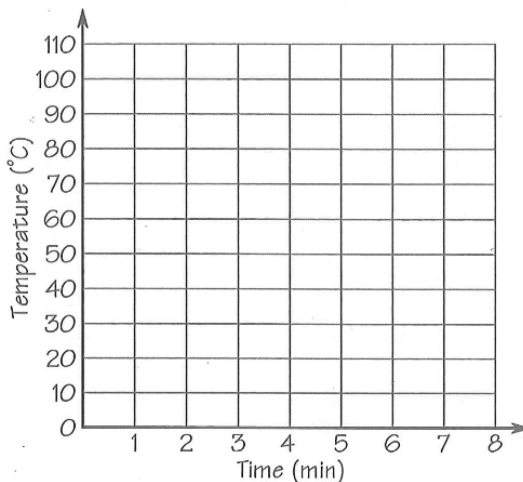
R I N D S O C K W H I F R A N U L I G E Y W E D S T

answer to puzzle:

# FUNction graFUN

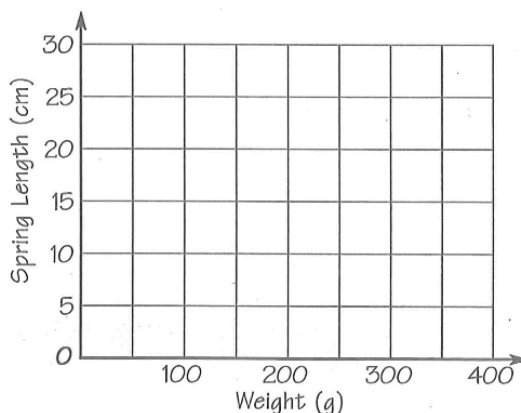
**Boiling Water.** A pot of water at a temperature of  $25^{\circ}\text{C}$  is placed on a hot burner. The temperature of the water increases at a rate of  $15^{\circ}$  per minute until it boils at  $100^{\circ}\text{C}$ . The water continues boiling at this temperature.

1. Complete the graph to show the relationship between water temperature ( $y$ ) and time since the water was placed on the burner ( $x$ ).
2. How long does it take for the water to boil?
3. What is the slope of the graph for temperatures between  $25^{\circ}\text{C}$  and  $100^{\circ}\text{C}$ ?
4. What is the slope of the graph after the temperature reaches  $100^{\circ}\text{C}$ ?
5. Write an equation for the part of the graph that has positive slope.



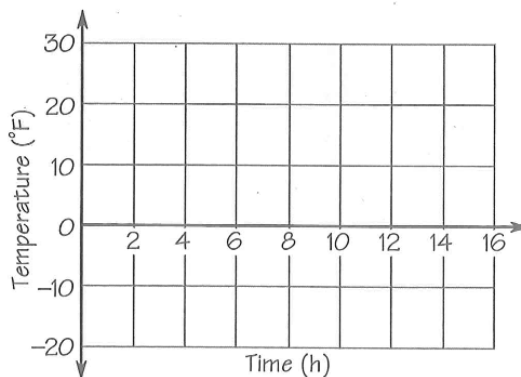
**Stretching a Spring.** A spring is 8 cm long with no weight suspended from it. For each 50-gram weight, the spring stretches 3 cm until it reaches a maximum length of 26 cm. The spring remains at this length even if more weights are added.

6. Complete the graph to show the relationship between spring length ( $y$ ) and weight that is added ( $x$ ).
7. How much weight must be added for the spring to reach maximum length?
8. What is the slope of the graph for spring lengths between 8 cm and 26 cm?
9. Write an equation for the part of the graph that has positive slope.



**Freezing Quickly.** At 10 P.M. the temperature in Quickfrozen was  $25^{\circ}\text{F}$ . The temperature dropped at a rate of  $5^{\circ}$  per hour for 8 hours. Then, for the next 8 hours, the temperature rose at a rate of  $3^{\circ}$  per hour.

10. Complete the graph to show the relationship between temperature ( $y$ ) and number of hours since 10 P.M. ( $x$ ).
11. What is the slope of the graph when the temperature is falling? When rising?
12. Write an equation for the part of the graph that has negative slope.
13. Give the  $y$ - and  $x$ -intercepts of the graph.



# Homework

Finish classwork

*Due Friday*