

Warm Up

9/20

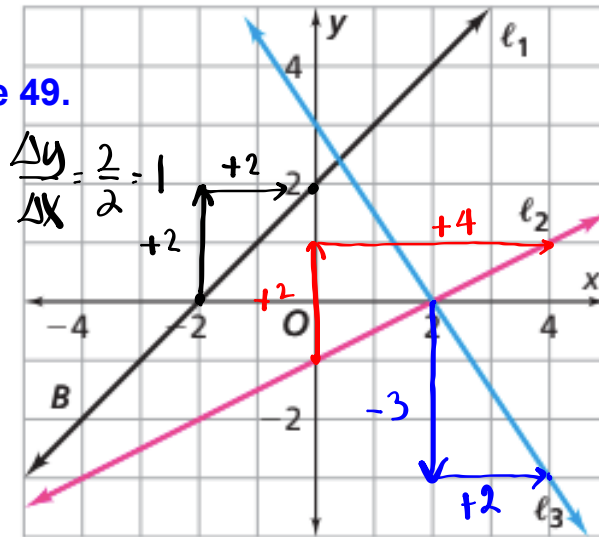
$$y = mx + b$$

20. Write an equation for each line in the graph below.

This is on Page 49.

$$y = 1x + 2$$

$$y = x + 2$$



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

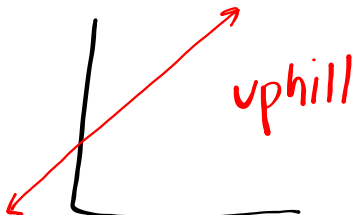
$$y = \frac{1}{2}x - 1$$

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

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

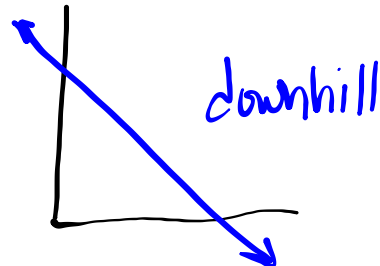
Positive Slope

Read from L → R
the line is rising



Negative Slope

Read from L → R
the line is decreasing



Certificate of Achievement

This certificate is awarded to

CYNTHIA PELTIER'S STUDENTS

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for outstanding completion of **200 math questions**




IXL DEAN OF STUDENTS

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



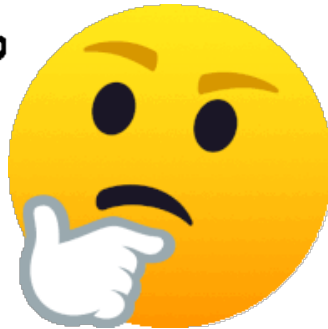
Slope
y-intercept

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

$$y = mx + b$$

Slope

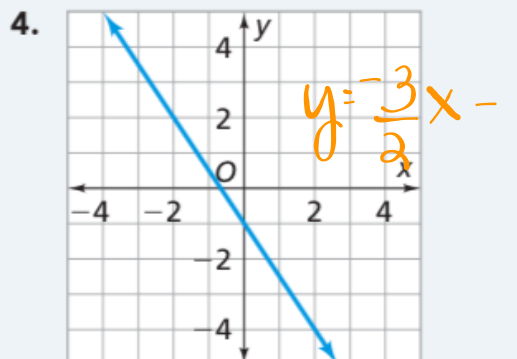
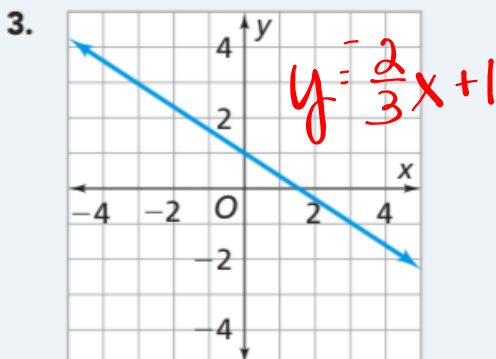
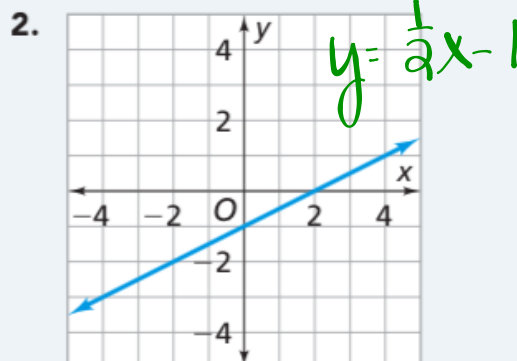
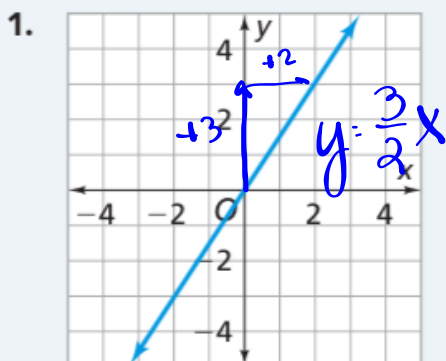
y-int.



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 $y = mx + b$.



- 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

$\Delta x = +1$ (above the table)
 $\Delta y = +2$ (below the table)
 (Note: The value 3 in the table is circled)

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

$$y = 2x + 3$$

b.

x	-6	-2	2	6	10
y	-4	-2	-1	2	4

$\Delta x = +4$ (above the table)
 $\Delta y = +2$ (below the table)
 (Note: The value -1 in the table is boxed)

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

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

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

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

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

$$y = mx + b$$

Slope

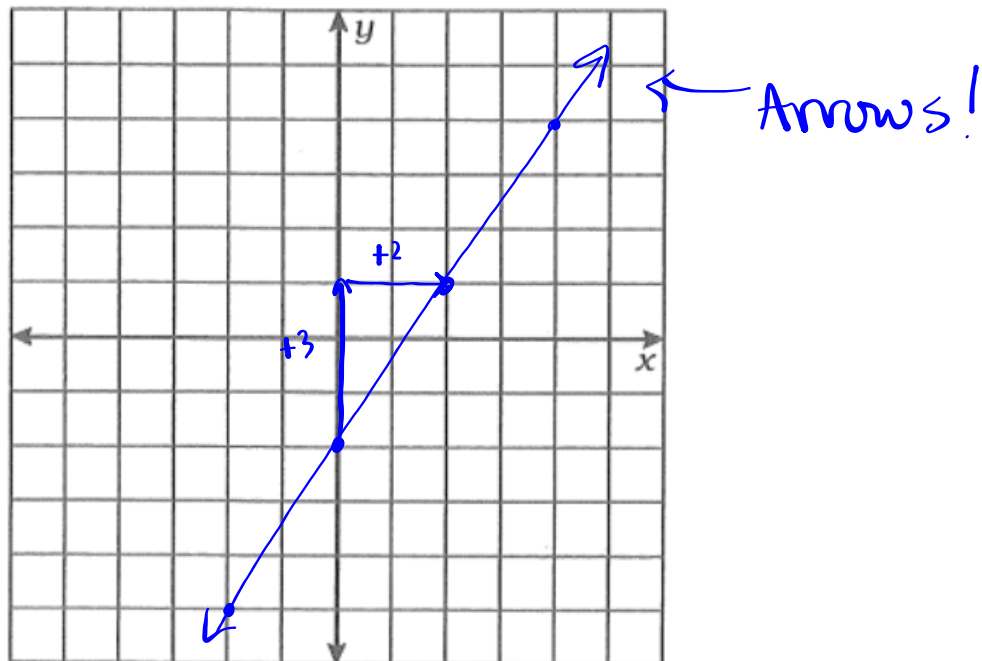
y-intercept

And we know:

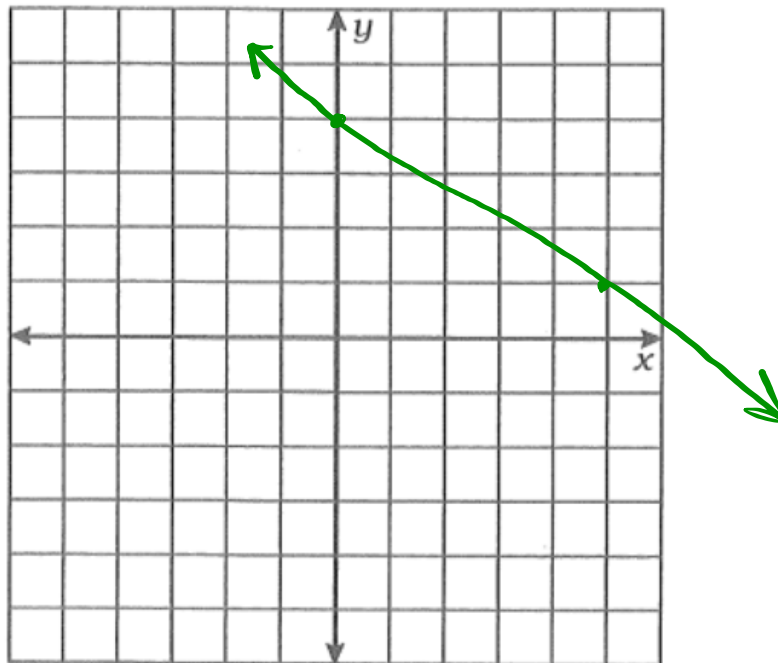
$$\text{Slope} = \frac{\Delta y}{\Delta x}$$

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

$$y = \overset{\text{slope}}{\left(\frac{3}{2}\right)}x - 2 \leftarrow \text{y-int}$$

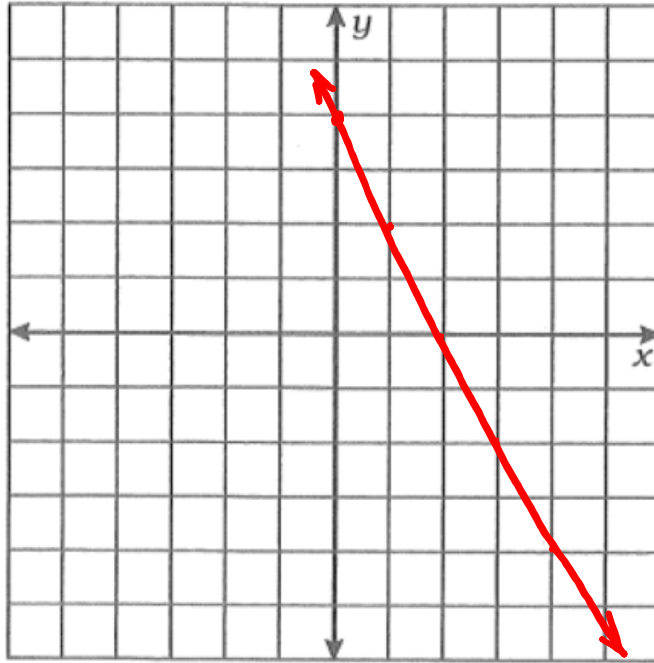


$$y = -\frac{3}{5}x + 4$$



$$y = -2x + 4$$

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

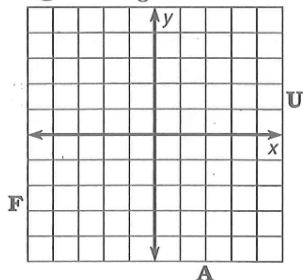


What Happened to the Little Boy Who Swallowed a Silver Dollar?

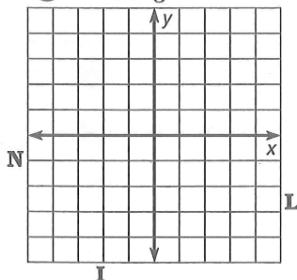
Use the slope and y-intercept to graph each equation. The graph, if extended, will cross a letter outside the grid. Look for this letter in the string of letters at the bottom of the page and cross it out each time it appears. When you finish, write the remaining letters in the rectangle at the bottom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



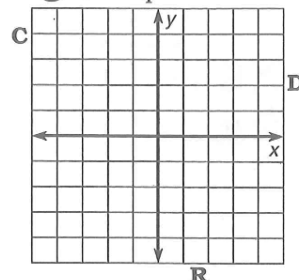
1 $y = \frac{2}{3}x + 1$



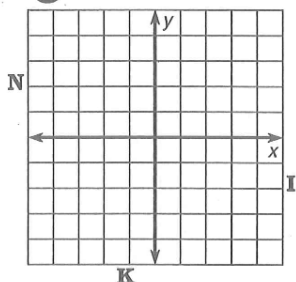
2 $y = -\frac{2}{3}x + 1$



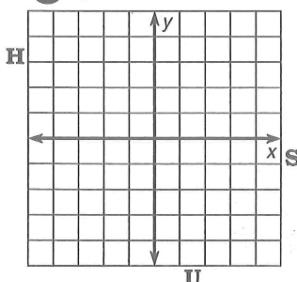
3 $y = \frac{3}{4}x - 2$



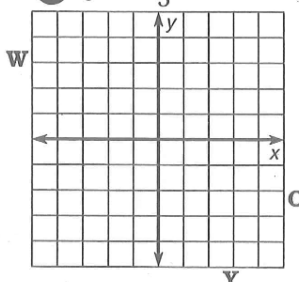
4 $y = 2x - 3$



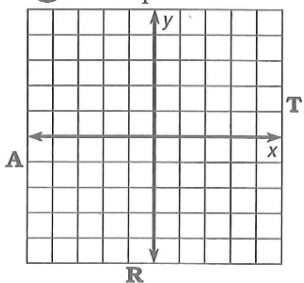
5 $y = -3x - 1$



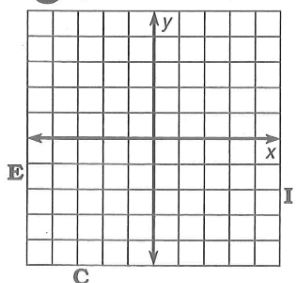
6 $y = -\frac{1}{5}x + 2$



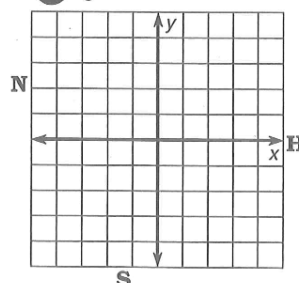
7 $y = \frac{7}{4}x - 4$



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:

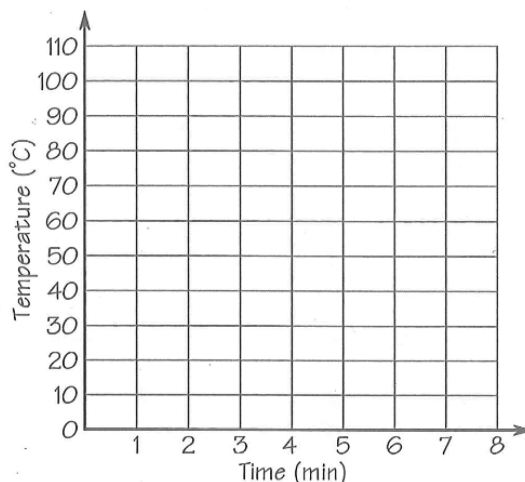
What happens if your slope looks like:

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

FUNction graFUN

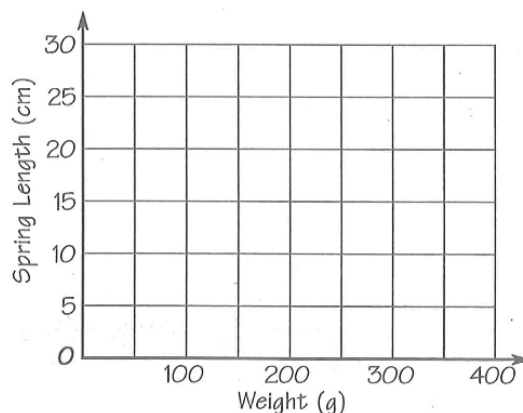
Boiling Water. A pot of water at a temperature of 25°C is placed on a hot burner. The temperature of the water increases at a rate of 15° per minute until it boils at 100°C . The water continues boiling at this temperature.

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°C and 100°C ?
4. What is the slope of the graph after the temperature reaches 100°C ?
5. Write an equation for the part of the graph that has positive slope.



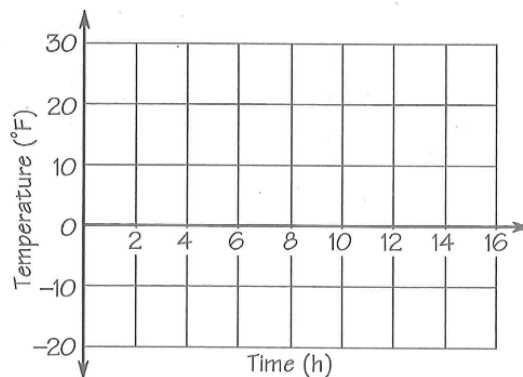
Stretching a Spring. A spring is 8 cm long with no weight suspended from it. For each 50-gram weight, the spring stretches 3 cm until it reaches a maximum length of 26 cm. The spring remains at this length even if more weights are added.

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°F . The temperature dropped at a rate of 5° per hour for 8 hours. Then, for the next 8 hours, the temperature rose at a rate of 3° 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