Warm Up

9/24

Does the data in this table represent a linear relationship? Explain how you know.

x	–2	0	2	4
y	7	3	–1	–5

+2, +2, +2

-4, -4, -4

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

Yes this is linear.

Why?
- There is a constant change in x-values and a constant change in y-values
* There is a constant slope between all points.

Why you can't assume something is linear if there is a constant change in x:

x	2	4	6	8
y	10	13	17	19

+2, +2, +2

+3, +4, +2

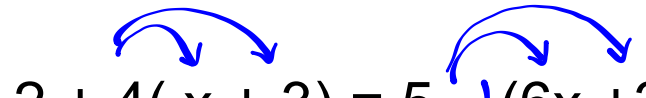
$\frac{\Delta y}{\Delta x} = \frac{3}{2}$ $\frac{\Delta y}{\Delta x} = 2$ $\frac{\Delta y}{\Delta x} = 1$

You don't know what the changes in y are.

Not linear because there is no constant slope between all points.

$\frac{\Delta y}{\Delta x} = \frac{3}{2} \neq 2 \neq 1$

Quick practice!



$2 + 4(x + 3) = 5 - 1(6x + 3)$ Distribute

$2 + 4x + 12 = 5 - 6x - 3$ CLT

$4x + 14 = 2 - 6x$

$+6x \qquad +6x$

$10x + 14 = 2$

$-14 \quad -14$

$\frac{10x}{10} = \frac{-12}{10}$

$x = \frac{-12}{10} = \frac{-6}{5}$

Pointers for Assessments

- Always show all your work/thinking.
- Use algebraic methods with proper format taught in class. No Guess and Check!
- Answers should remain as fractions unless they are terminating decimals, or it is a real life problem.
- Assessments are designed to be completed within the class period if you fully understand the material and are working steadily.
- All assessments must be completed by the end of the day.

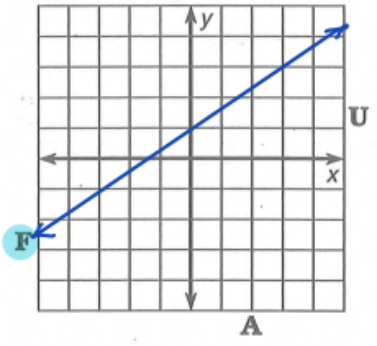
KEY

Homework Questions?

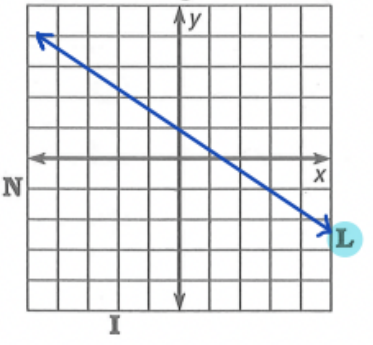
What Happened to the Little Boy Who Swallowed a Silver Dollar?

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.

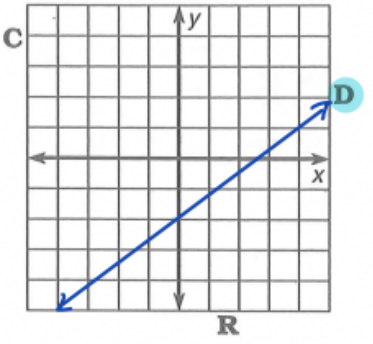
1. $y = \frac{2}{3}x + 1$



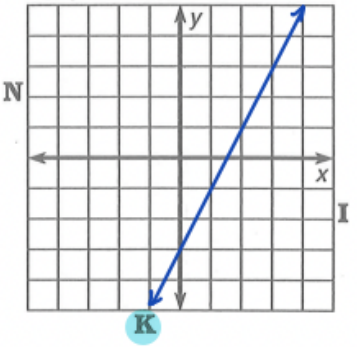
2. $y = -\frac{2}{3}x + 1$



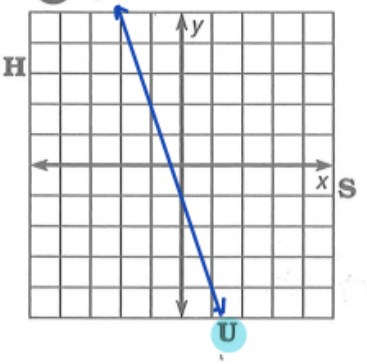
3. $y = \frac{3}{4}x - 2$



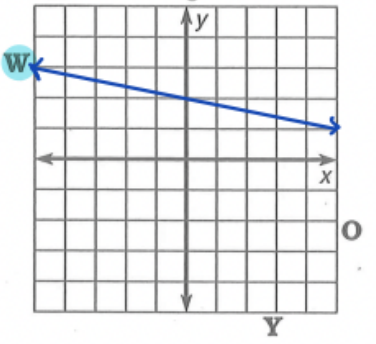
4. $y = 2x - 3$



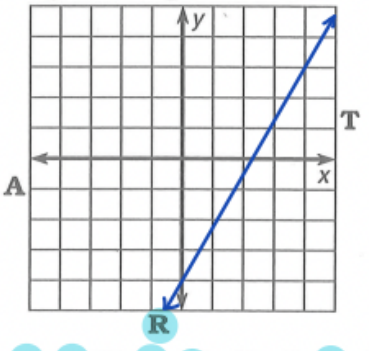
5. $y = -3x - 1$



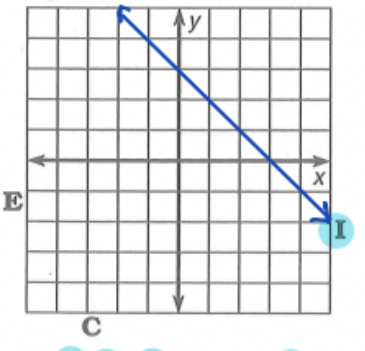
6. $y = -\frac{1}{5}x + 2$



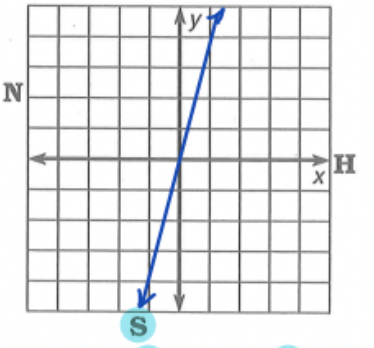
7. $y = \frac{7}{4}x - 4$



8. $y = -x + 3$



9. $y = 4x$



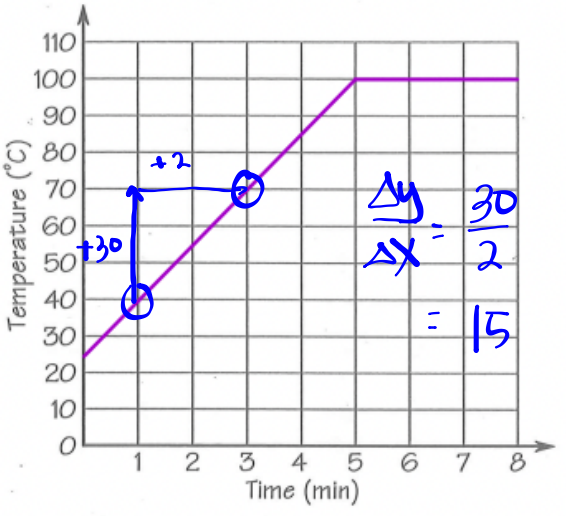
R I N D S O C K W H I F R A N U L I G E Y W E D S T

answer to puzzle: NO CHANGE YET

FUNction graFUN

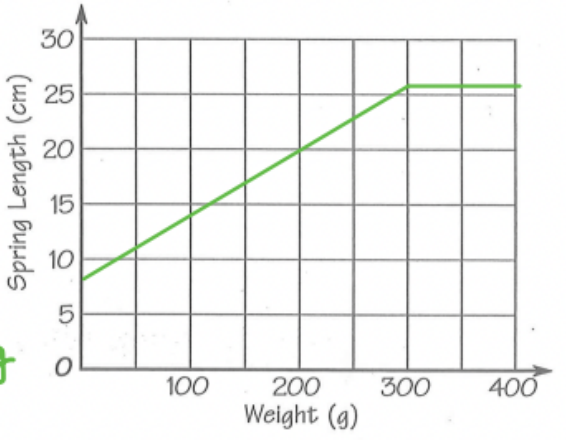
Boiling Water. A pot of water at a temperature of 25°C is placed on a hot burner. The temperature of the water increases at a rate of 15° per minute until it boils at 100°C. The water continues boiling at this temperature.

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? 5 minutes
3. What is the slope of the graph for temperatures between 25°C and 100°C? 15 degrees/minute
4. What is the slope of the graph after the temperature reaches 100°C? slope = 0
5. Write an equation for the part of the graph that has positive slope. $y = 15x + 25$



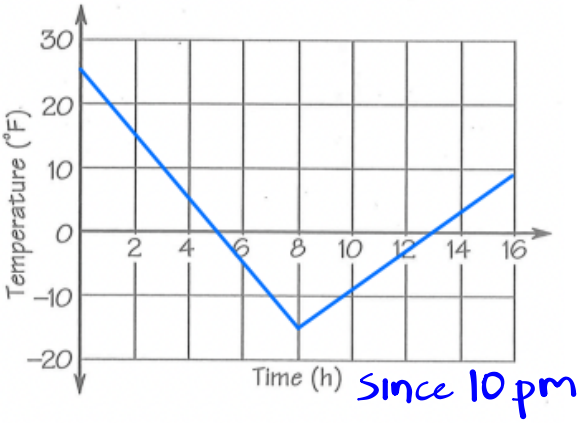
Stretching a Spring. A spring is 8 cm long with no weight suspended from it. For each 50-gram weight, the spring stretches 3 cm until it reaches a maximum length of 26 cm. The spring remains at this length even if more weights are added.

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? 300 g
8. What is the slope of the graph for spring lengths between 8 cm and 26 cm? 0.06 cm/g
9. Write an equation for the part of the graph that has positive slope. $y = 0.06x + 8$



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? −5 +3
12. Write an equation for the part of the graph that has negative slope. $y = -5x + 25$
13. Give the y- and x-intercepts of the graph. (0,25) (5,0)



Finish Problem 2.2 C and E

C The points $(4, 2)$ and $(-1, 7)$ lie on a line.

1. What is the slope of the line?
2. Find two more points that lie on this line. Describe your method.
3. Yvonne and Jackie observed that any two points on a line can be used to find the slope. Are they correct? Explain why or why not.

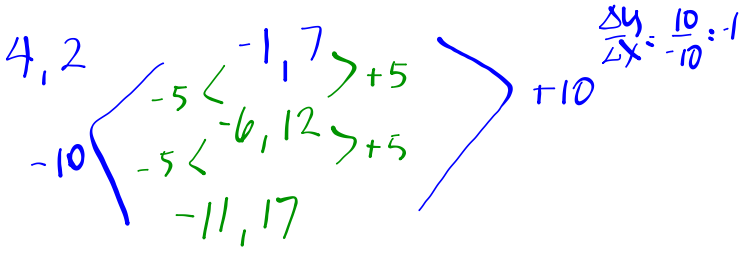
D Kevin said that the line with equation $y = 2x$ passes through the points $(0, 0)$ and $(1, 2)$. He also said the line with equation $y = -3x$ passes through the points $(0, 0)$ and $(1, -3)$. In general, lines with equations of the form $y = mx$ always pass through the points $(0, 0)$ and $(1, m)$. Is he correct? Explain.

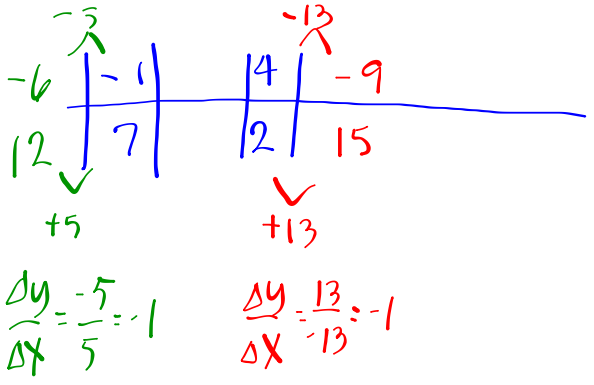
E What is the slope of a horizontal line? Of a vertical line?

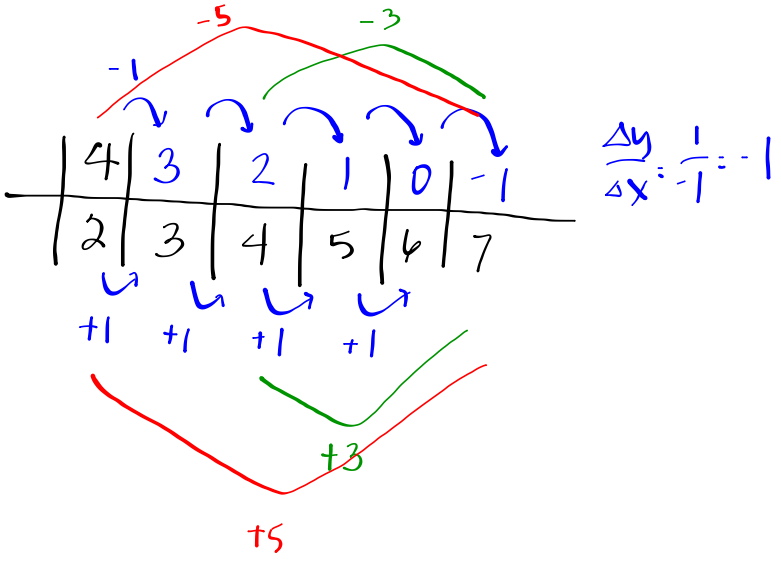
C The points $(4, 2)$ and $(-1, 7)$ lie on a line.

1. What is the slope of the line? $\frac{\Delta y}{\Delta x} = \frac{-1}{1}$
2. Find two more points that lie on this line. Describe your method.
3. Yvonne and Jackie observed that any two points on a line can be used to find the slope. Are they correct? Explain why or why not.

Best tool for this problem is making a table!







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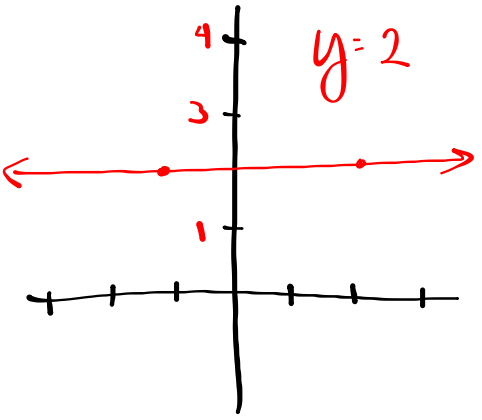
proportional relationship

- linear
- y-int = (0,0)

E What is the slope of a horizontal line? Of a vertical line?

Draw them and make your calculations.

Horizontal



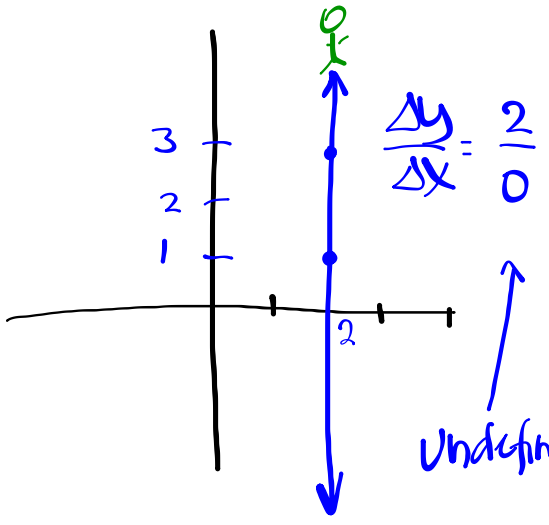
$\frac{\Delta y}{\Delta x} = \frac{0}{3} = 0$ Zero Slope

$y = mx + b$

$y = (0)x + 2$

$y = 2$

Vertical



No Slope

$x = 2$

Homework

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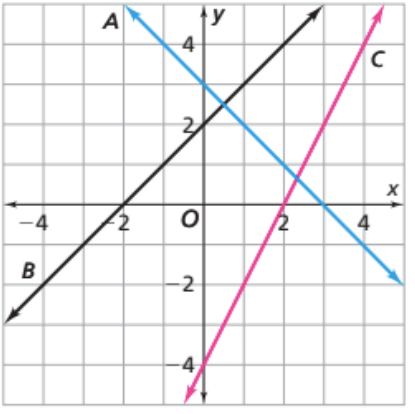
6. Here is a graph of three lines.



a. Complete the table.

Line	Constant Rate of Change	*y*-intercept	*x*-intercept
A			
B			
C			

b. Here are the equations of the three lines. Match each line with its equation.

equation D: $y = 2 + x$

equation E: $y = -4 + 2x$

equation F: $y = 3 - x$

line A

line B

line C