

1. What is another name for "initial value"? y-intercept How can you recognize it on a graph? where the line crosses the y-axis How can you recognize it on a table? the y-value when x=0
2. When you are writing a "line of best fit" (aka "linear model") from a scatterplot, first you choose 2 points and find the slope. Then you use the slope and one point to write the linear equation. Rewrite your equation in slope-intercept form.
3. What is another word for "rate of change"? Slope How do you find "rate of change" from a table?  $\frac{\text{change in } y}{\text{change in } x}$ . If the rate of change is positive, the function is increasing/decreasing (circle one). If the rate of change is negative, the function is increasing/decreasing (circle one).
4. Write an algebraic equation that describes the relationship between x and y.

x	y
0	5
1	11
2	17
3	23
4	29

+15  
+6

$$m = \frac{6}{1}$$

b = 5 because when x=0, y=5

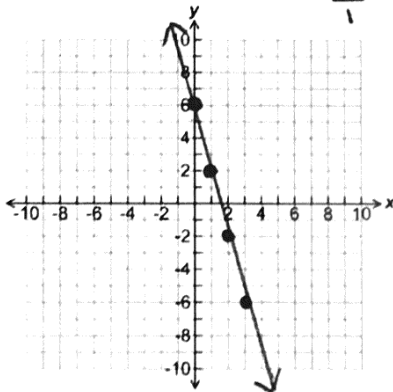
$$y = 6x + 5$$

5. Does this table represent a linear function? Why or why not?  
No; no constant rate of change/slope

x	y
0	3
1	8
2	12
3	17
4	21

+15  
+15  
+5  
+4

6. Draw a graph that has a slope of  $-\frac{4}{1}$  and has an initial value of 6.  
y-intercept



7. What is the linear model (equation of the line) that represents the graph in #6?  
 $y = -4x + 6$

slope

8. Find the "rate of change" for each of the following and tell whether it is increasing or decreasing:

A.  $y = -13x - 4$  -13 decreasing    B.  $y = x - 10$  1 increasing

C.  $y = 6x + 4$  6 increasing    D.  $y = \frac{3}{5}x + 6$   $\frac{3}{5}$  increasing

9. Which equation in #8 has the least rate of change? D ( $\frac{3}{5}$ ) which has the greatest rate of change? A (-13) \* Remember: When comparing functions, the sign of the slope doesn't matter.

10. Determine the rate at which a hot air balloon rises given the information in the table:

(note: the balloon is tethered, not touching the ground, at take-off). **Interpret what the rate means.**

		+4				
Minutes	8	12	20	25	28	30
Height (ft.)	99	147	243	303	339	363
		+48				

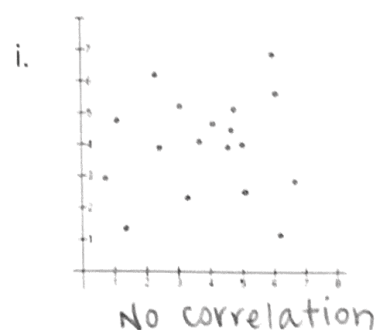
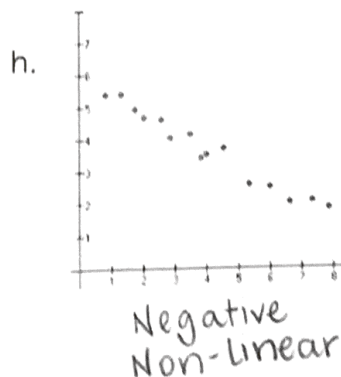
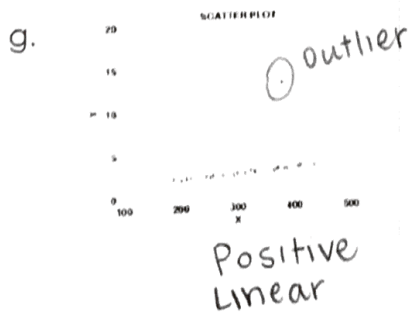
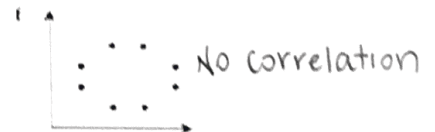
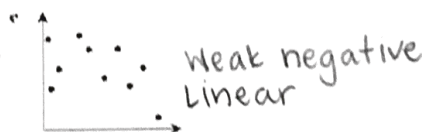
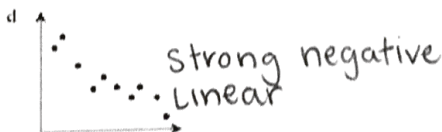
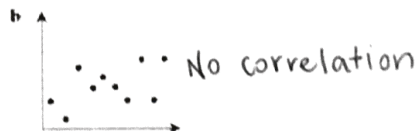
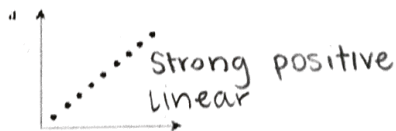
Rate: 12 feet per minute  
 $(8, 99)$   $(12, 147)$   
 $m = \frac{147 - 99}{12 - 8} = \frac{48}{4} = 12$

11. Write the equation which represents the height of the hot air balloon as a function of minutes during flight.

Equation:  $y = 12x + 3$

$y - 99 = 12(x - 8)$   
 $y - 99 = 12x - 96$   
 $+99$                      $+99$   
 $y = 12x + 3$

12. Identify the patterns for each of the scatter plots as positive or negative association, strong or weak, linear association, nonlinear association, no correlation and/or outliers-there may be more than 1 answer for each graph. Write the description on each graph. (notice there are 9 graphs)



13. Mellow Mushroom is selling plain cheese pizzas for \$12 and each additional topping is \$0.40.

a. Create a table showing the price  $P$  you would pay for a pizza with  $t$  toppings.

Include values for 0 to 10 toppings in increments of 2.

b. What is the rate of change? \$0.40 (per topping)

c. What is the initial value? \$12

What does initial value represent? cost of plain pizza

d. Write an equation relating the cost of a pizza " $P$ " and number of toppings " $t$ "

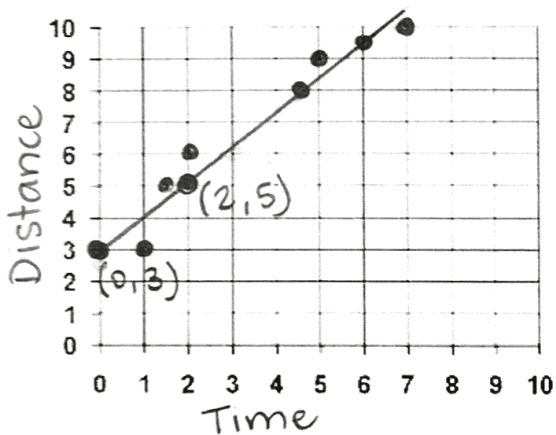
$$y = 0.40x + 12$$

T toppings	cost P
0	12
2	12.80
4	13.60
6	14.40
8	15.20
10	16.00

14. Jaxon spent a week camping and hiking. The data of each hike is recorded in the table. Plot the graph.

Be sure to label your axes.

Time	1	1.5	2	4.5	5	6	7
Distance	3	5	6	8	9	9.5	10

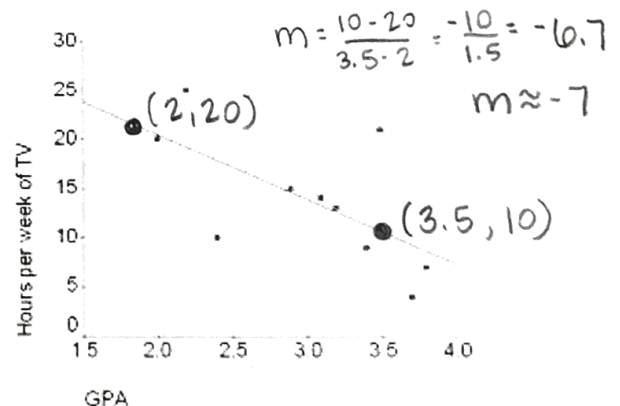


- a. Draw a line of best fit (linear model). *\*Remember: Your line of best fit may be a little different*
- b. What is the initial value? 3
- c. What is the rate of change? 1  $\frac{5-3}{2-0} = \frac{2}{2} = 1$
- d. Write the equation for the line of best fit  $y = 1x + 3$
- e. What is the correlation of the 2 values? positive
- f. How far do you predict Jaxon will hike after 10 hours? 13 ft.

15. Analyze the scatter plot to the right:

Interpret the correlation between the variables.

As GPA increases, the hours of TV each week decreases



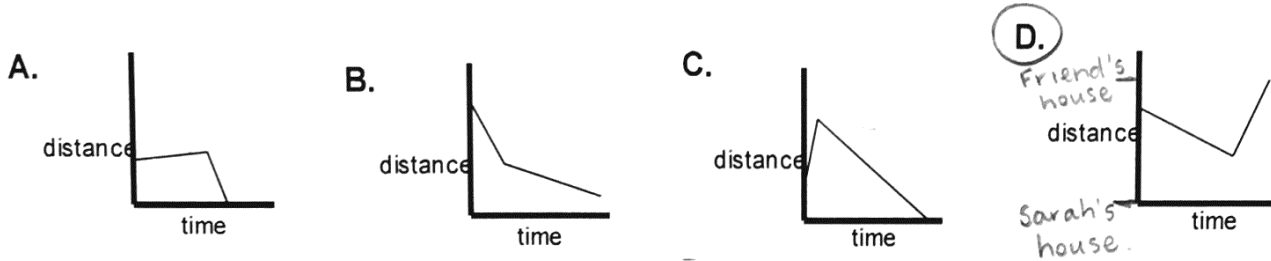
What equation could you use to determine your score based on the number of hours studied? (in other words, what is the approximate equation of the line of best fit... aka the linear model)

$$y = -7x + 24$$

\*remember the rate of change is the change in  $y$  OVER the change in  $x$ ;  $y-y$  OVER  $x-x$ .

Choose the correct answer.

16. Sarah is almost to her friend's house for a sleepover (Sarah's house is at 0 distance). She gets homesick and starts walking home. Then she realizes how much fun she would have at the sleepover and runs to her friend's house. Which graph represents her travels?



17. This table shows a linear relationship between 2 quantities. Find the equation that represents this relation:  $y = 3x + 4$

$$m = \frac{6}{2} = 3$$

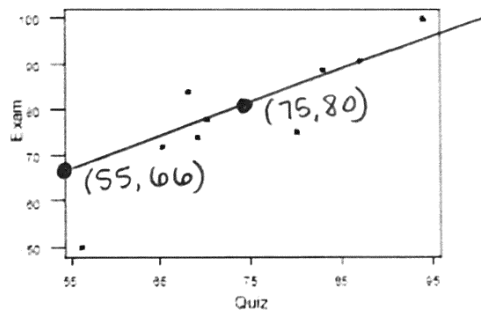
$$b = 4 \text{ because when } x=0, y=4$$

X	0	2	4	6	8	10
Y	4	10	16	24	30	36

18. Write an equation for the line of best fit comparing quiz grades with exam grades  $y = \frac{7}{10}x + 66$

$$m = \frac{80 - 66}{75 - 55} = \frac{14}{20} = \frac{7}{10}$$

$$b = 66 \text{ because that is where the line crosses the y-axis}$$



19. Complete the two way table below with the given information:

At Palmer Middle school, there are 1,100 students. Of those students, 550 are female. Our band program has 376 male participants, while 245 female students do not participate in band. There are 681 students in the band program.

	Male	Female	Total
Band	376	305	681
No Band	174	245	419
Total	550	550	1100