

Pre-Algebra, Unit 8 Practice Test: Investigate Patterns of Association in Bivariate Data (Scatter Plots and Two-Way Tables)

Name: _____

Date: _____

1. Define *bivariate data*.

2. Define *relative frequency*.

3. (a) Define and give an example of *quantitative data*, also called _____.
(*numerical or categorical*).

- (b) Define and give an example of *qualitative data* also called _____.
(*numerical or categorical*).

4. When analyzing bivariate data with quantitative variables, we usually organize the data in a _____. If both variables are qualitative, we usually organize the data in a _____.

5. Describe how to determine if a scatter plot:
 - a. Has a positive, negative, or no correlation?

 - b. Is classified as linear or nonlinear?

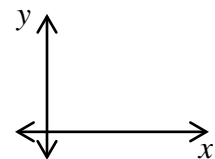
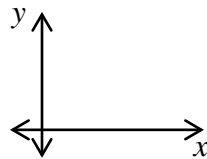
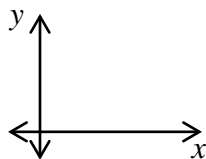
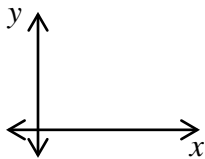
 - c. Has a correlation strength that is weak, moderate, or strong?

6. Describe how to draw the *line of best fit* for a scatter plot.



7. (SE) Would you expect a positive association, a negative association, or no association between the data sets listed below?
- number of text messages you send each month and your monthly cell phone bills
 - people's ages and the number of pets they own
 - number of times you brush your teeth and the number of cavities you get

8. Sketch a scatter plot in each of the four graphs below to show the following associations:
- negative linear*
 - positive nonlinear*
 - positive linear*
 - no association*



9. The table shows the depth of a river for several months after the rainy season ended.

Month	0	1	2	3	4	5	6	7	8
Depth in feet	22	21	17	15	13	12	10	8	7

A) Make a scatter plot of the data. Draw a line of best fit.

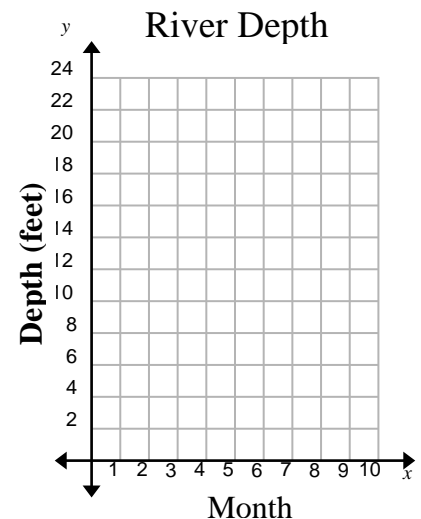
B) What type of association is shown on this scatter plot?

C) Write an equation for the line of best fit. Show your work.

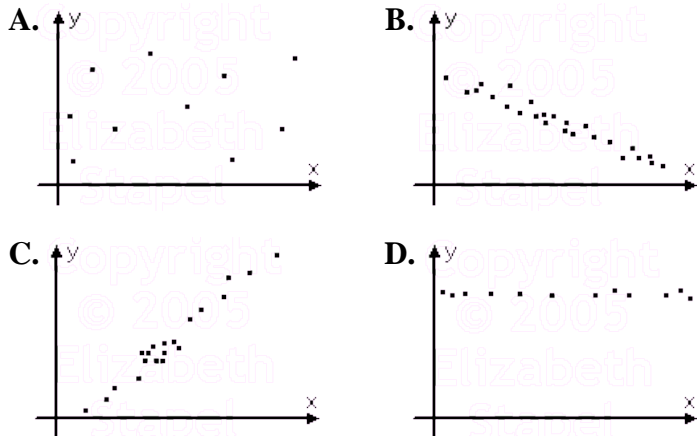
D) Interpret the slope and y-intercept of the trend line.

E) Predict the depth in month 10. Show your work.

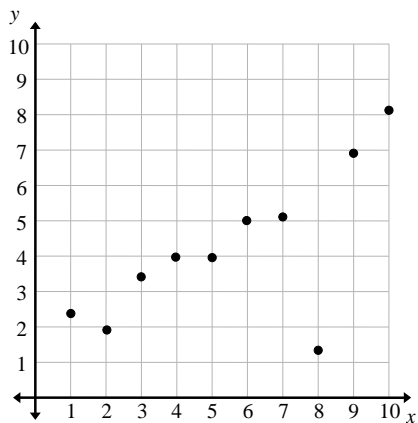
F) Is your answer in part E an example of extrapolation or interpolation?



10. (SE) Choose the graph below that shows a strong positive association between x and y .

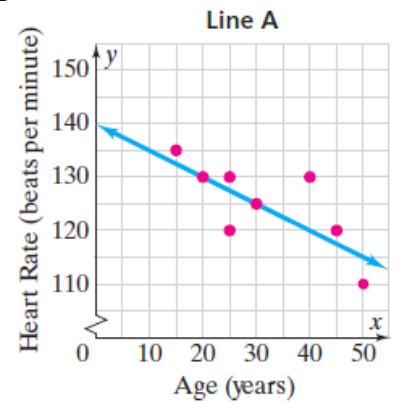


11. (SE) Which equation most accurately describes the line of best fit for the data shown in the scatter plot?



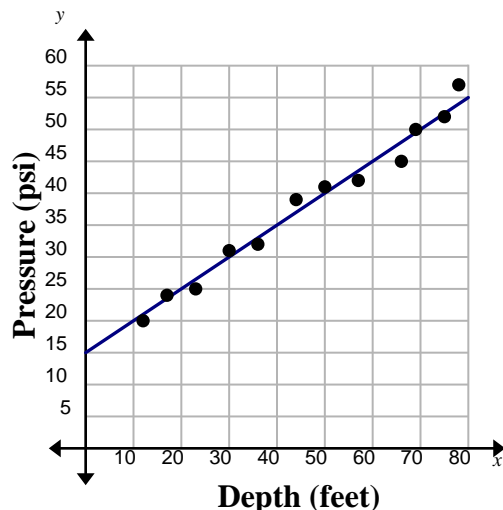
- (A) $y = -\frac{2}{3}x + 1$
- (B) $y = -3x + 2$
- (C) $y = \frac{2}{3}x + 1$
- (D) $y = 3x + 2$

12. (SE) The scatter plot shows a person's age in years compared to their heart rate. How should the slope and y -intercept be interpreted?



- (A) The slope of -2 means that heart rate decreases two beats every minute for every year that you age.
The y -intercept is 0 which is the heart rate of a newborn baby.
- (B) The slope of $-\frac{1}{2}$ means that heart rate decreases one-half beat every minute for every year that you age.
The y -intercept is 140 which is the heart rate of a newborn baby.
- (C) The slope of -2 means that heart rate decreases two beats every minute for every year that you age.
The y -intercept is 140 which is the heart rate of a newborn baby.
- (D) The slope of $-\frac{1}{2}$ means that heart rate decreases one-half beat every minute for every year that you age.
The y -intercept is 0 which is the heart rate of a newborn baby.

Problems 13-15: Divers reported the pressure at various depths underwater. A scatter plot of their data is shown.



13. Using the trend line, what is the pressure (psi) at 40 feet?

- A. 35 B. 40 C. 45 D. 50

14. Which equation would best represent the trend line?

- A. $y = x + 15$ B. $y = .5x + 15$
 C. $y = 2x$ D. $y = .5x$

15. Using the equation for the trend line, estimate the pressure (psi) at 100 feet.

- A. 115 B. 65 C. 200 D. 50

16. Sixty British students each visited one foreign country last week. Fifteen percent of the students visited Spain – of these fifteen percent, one-third of the students were female.

	France	Germany	Spain	Total
Female				30
Male	15			
Total		25		60

a) Complete the two-way table by filling in all the empty cells.

b) Given that the student is from the group of sixty British students, what is the relative frequency that a student is male and visited Germany? (Write your answer as a simplified fraction and as a percent.)

_____ fraction _____ percent

c) Given that the student is male and from the group of sixty British students, what is the relative frequency that he visited Germany,? (Write your answer as a simplified fraction and as a percent.)

_____ fraction _____ percent

17. (SE) A total of 200 people were asked which they preferred, candy or trail mix. Of the 200 people, 120 were male. Trail mix was preferred by 45 females; candy was preferred by 70 males. Which two way table represents this poll?

A.

	Preferred Trail Mix	Preferred Candy	Total
Male	50	70	120
Female	45	35	80
Total	95	105	200

C.

	Preferred Trail Mix	Preferred Candy	Total
Male	70	50	120
Female	35	45	80
Total	105	95	200

B.

	Preferred Trail Mix	Preferred Candy	Total
Male	70	50	120
Female	45	35	80
Total	115	95	200

D.

	Preferred Trail Mix	Preferred Candy	Total
Male	50	70	120
Female	35	45	80
Total	85	115	200



18. (SE) During a survey students at a middle school were asked whether or not they ride the bus to school. The results are shown in the table.

Approximately what percentage of the 8th graders surveyed ride the bus?

- (A) 10%
- (B) 21%
- (C) 30%
- (D) 51%

	6 th Grade	7 th Grade	8 th Grade	Total
Ride Bus	20	15	9	44
Does Not Ride Bus	12	10	21	43
Total	32	25	30	87

19. (SBAC) During a survey fifteen 8th graders were asked whether they regularly drink water or soda at lunch. The results are shown in the table to the right.

Part A Use the results of the survey to complete the two-way table below:

Lunch Drink	Gender	
	Male	Female
Water		
Soda		

Part B State whether the results of the survey provide evidence that male students prefer soda. Explain your answer.

Student	Gender		Lunch Drink	
	Male	Female	Water	Soda
A	✓		✓	
B		✓	✓	
C	✓			✓
D		✓		✓
E		✓	✓	
F		✓		✓
G		✓	✓	
H	✓		✓	
I	✓		✓	
J	✓			✓
K		✓	✓	
L		✓		✓
M	✓			✓
N	✓			✓
O	✓			✓

Long Term Memory Review

20. Solve the linear system algebraically.

Show your work.

$$y = x + 4$$

$$y = -3x - 8$$

