

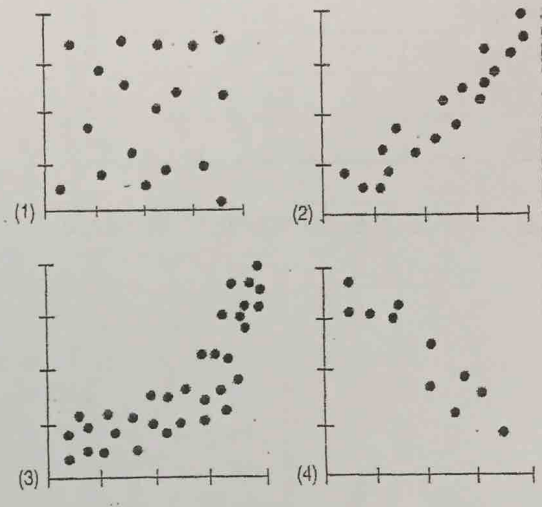
## Unit 4, Module 11: Scatterplots, Linear Relationships and Correlation

1. Suppose you were to collect data for each of the following pairs of variables. You want to make a scatterplot. Which variable would you use as the explanatory variable and which as the response? Why? What would you expect to see in the scatterplot? Discuss the likely direction and strength.

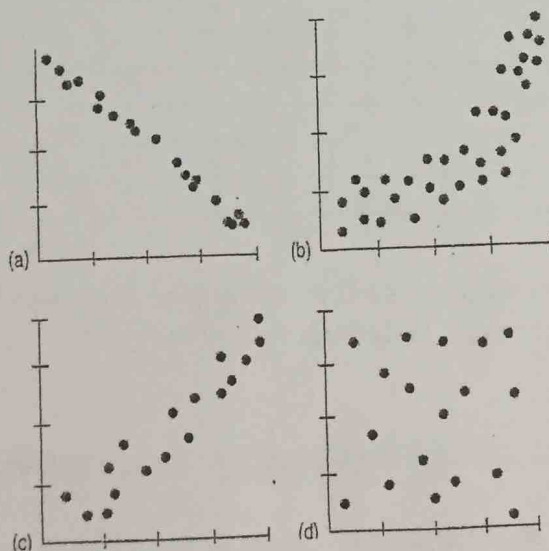
- Lightning Strikes:** distance from lightning, time delay of thunder
- Streetlight:** its apparent brightness, your distance from it
- Does sleep affect your grades:** sleep, G.P.A.

2. Which of the following scatter plots show (you can use the graphs multiple times, if needed):

- Little or no association
- A negative association?
- A linear association?
- A moderately strong association?
- A very strong association?



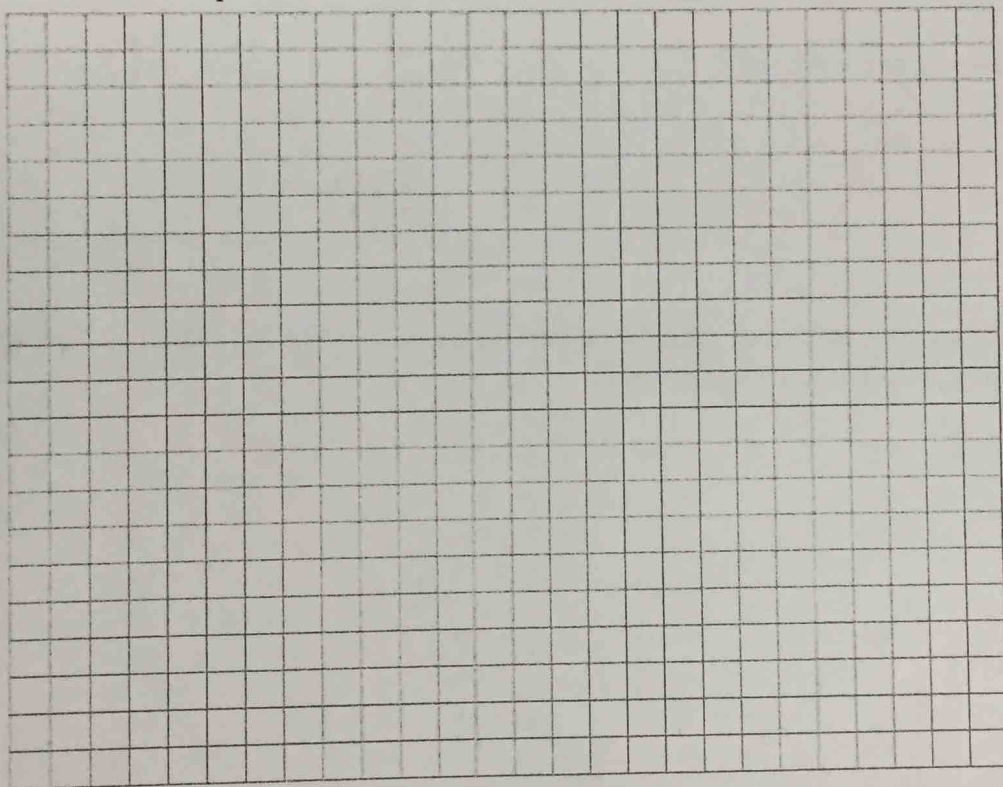
3. Here are several scatterplots. The calculated correlations are:  $-0.977$ ,  $-0.021$ ,  $0.736$  and  $0.951$ . Which correlation belongs to which graph?



4. A survey was conducted in the US and 10 countries of Western Europe to determine the percentage of teenagers who had used marijuana and other drugs. The results are summarized in the table below:

Country	Marijuana	Other Drugs
Czech Rep.	22	4
Denmark	17	3
England	40	21
Finland	5	1
Ireland	37	16
Italy	19	8
No. Ireland	23	14
Norway	6	3
Portugal	7	3
Scotland	53	31
USA	34	24

- a. Create a scatterplot of the data



- b. What is the correlation between the percent of teens who have used marijuana and the percent who have used other drugs? (Use technology for this!)
- c. Write a brief description of the association (direction, form, strength)
- d. Do these results confirm that marijuana is a "gateway drug", that is, that marijuana use leads to the use of other drugs? Explain.