1. A total of 1200 patients suffering from severe post-operative pain were randomly assigned to one of three experimental conditions: Patients in Condition I were provided with a new pain killer; Patients in Condition II were provided with a pain killer which was in fact a completely neutral substance. Patients in Condition III were not provided with any pain killers. Following that, patients in Condition II were less likely to report post-operative pain as compared to patients in Condition III.

   Which of the following best accounts for this difference?

   A. Regression effect
   B. Regression fallacy
   C. Simpson's paradox
   D. Placebo effect

2. A total of 1000 undergraduate students (800 females) were assigned to one of two experimental conditions based on a *partial* chance procedure.

   What is the ratio of females to males *within* each condition?

   A. 800:200
   B. 200:800
   C. 500:500
   D. Not possible to tell

3. In a hypothetical scenario, a student conducts a comprehensive literature review on the relationship between coffee drinking (coffee vs. no coffee) and attention span (high attention span vs. low attention span). Out of 10 articles, 3 randomised controlled experiments found no association between coffee drinking and attention span. The remaining 7 non-randomised studies with control groups found a positive association between coffee drinking and attention span.

   What should he conclude from his literature review?

   A. Coffee drinking increases attention span
   B. Coffee drinking decreases attention span
   C. Coffee drinking maintains attention span
   D. None of the above

4. In one study, researchers found a positive association between being a dentist and suicide.

   Which of the following statement(s) must be true?

   I. The rate of suicide among dentists is greater than the rate of non-suicide among dentists
   II. The rate of dentists among suicide is greater than the rate of non-dentists among suicide
   III. The rate of suicide among dentists is less than the rate of non-suicide among non-dentists
   IV. The rate of non-suicide among non-dentists is less than the rate of suicide among dentists

A. I
B. I & II
C. III & IV
D. None of the above

5. A researcher was interested in the relationship between smoking and lung cancer. From a population, he randomly sampled a total of 500 smokers and 700 non-smokers, and observed if these participants eventually developed lung cancer. He obtained the following results:

	Lung Cancer	No Lung Cancer	Row Total
Smoker	400	100	500
Non-Smoker	200	500	700
Column Total	600	600	1200

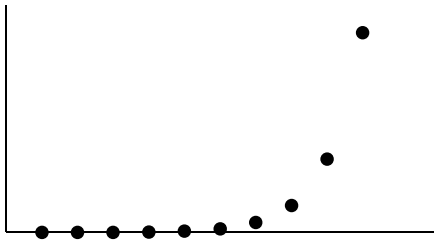
Which of the following ratios provide a good estimate of the odds of smoking among lung cancer patients within the population?

A. 400 / 100
B. 400 / 200
C. 400 / 500
D. None of the above

6. In the same study described in Question 5, what is the population odds ratio of smoking among lung cancer patients, relative to non-lung cancer patients?

A. (400 / 500) / (200 / 700)
B. (400 / 500) / (200 / 100)
C. (400 / 200) / (100 / 500)
D. None of the above

7.



Describe the association depicted in the scatter diagram above.

A. Positive linear association
B. Negative linear association
C. Positive curvilinear association
D. Negative curvilinear association

8. Students in a university fill out questionnaires, providing their age, gender, year of birth, height and weight. The correlation between these students' age and their year of birth is closest to:

A. + 1
B. + 0.5
C. - 0.5
D. - 1

9. Some studies have found an association between liver cancer and smoking, while others have found an association between liver cancer and alcohol consumption.

I. Smoking is associated with alcohol consumption
II. Smoking causes alcohol consumption

Based on the information above, which of the above statements must be true?

A. I
B. II
C. I and II
D. Neither I nor II

10. In a clinic, two surgeons – Dr. Fixit (Dr. F) and Dr. Patch (Dr. P) – operated on patients who were either in good or poor condition with the following results:

Good Condition		
	Dr. F	Dr. P
Died	8	17
Survived	60	120

Poor Condition		
	Dr. F	Dr. P
Died	52	33
Survived	130	80

The well-intentioned clinic assistant felt that presenting both tables to potential patients would be too confusing, and therefore decide to present the following table instead:

	Dr. F	Dr. P
Died	A	B
Survived	C	D

Calculate the survival rate among (a) Dr. Fixit's patients, and (b) Dr. Patch's patients.

A. 0.76; 0.80
B. 0.80; 0.76
C. 0.76; 0.76
D. 0.80; 0.80

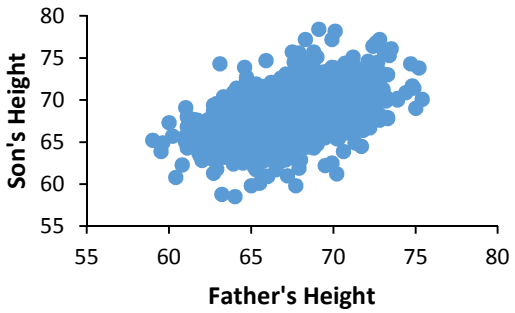
11. A small data set is shown below ($r \approx 0.76$).

X	Y
1	2
2	3
3	1
4	5
5	6

A researcher decides to calculate the correlation coefficient between u = x + 50 and v = 50 * y. Which of the following values will he obtain?

A. 0.38
B. 0.76
C. 0.15
D. 0.015

12.



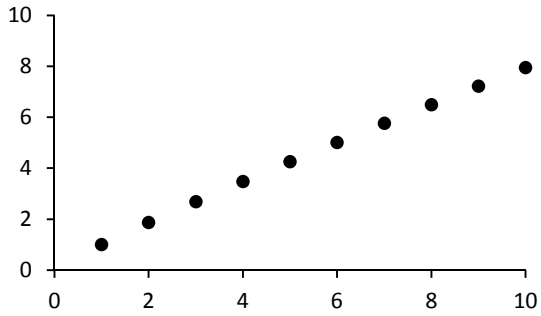
In the father-son data set shown above, which of the following is most likely to occur if the data from sons of fathers of height 68 inches were removed?

A. Regression effect
B. Attenuation effect
C. Regression fallacy
D. Placebo effect

13. A researcher correlated students' heights (in metres) with their weight (in kilograms). What is the units of the correlation coefficient obtained?

A. m / kg
B. kg / m
C. kg / m^2
D. No units

14.



In the scatter plot shown above, what happens to the correlation coefficient if a new point (x = 4, y = 10) is added?

A. The correlation coefficient increases
B. The correlation coefficient decreases
C. The correlation coefficient turns from positive to negative
D. The correlation coefficient turns from negative to positive

Suggested Answers

1. D
2. D
3. D
4. D
5. D
6. C
7. C
8. D
9. D
10. A
11. B
12. B
13. D
14. B