

Homework Answers

20. Roller coasters again.

There is a strong, positive, linear association between drop and speed; the greater the height of the initial drop, the higher the top speed.

1) 1

2) 1

25. Kentucky derby 2013.

3) 1

a) The relationship is positive, moderately strong, and curved. Winning speeds in the Kentucky Derby have generally increased over time. The association between year and speed is moderately strong, and seems slightly curved, with a greater rate of increase in winning speed before 1950 and a smaller rate of increase after 1950, suggesting that winning speeds have leveled off over time.

4) 1

5) 1

b) It is not appropriate to summarize the strength of the association between year and winning speed with a correlation, since the association is curved, not Straight Enough.

6) 1

7) 1

29. Cellular telephones and life expectancy.

8) 1

a) No. It simply means that in countries where cell phone use is high, the life expectancy tends to be high as well.

9) 1

b) General economic conditions of the country could affect both cell phone use and life expectancy. Richer countries generally have more cell phone use and better health care. The economy is a lurking variable.

10) 1

Multiple Choice Practice Worksheet

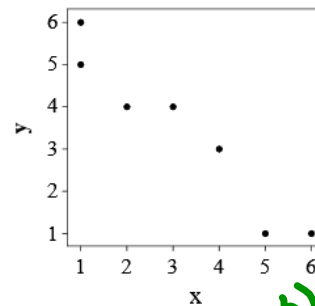
1. All but one of the statements below contains a mistake. Which one could be true? *cat: var*
- A) The correlation between the time it takes to get ready in the morning and gender is 0.78.
 - B) The number of apricots on a tree and the amount of fertilizer has a ~~1.12~~ correlation. *> 1*
 - C) The correlation between the height of a bean plant and the day is 0.78 in/day. *no units*
 - D) The correlation between your golf score and the number of hours you practice is -0.36.
2. Which of the statements below contains a mistake?
- A) A new car owner keeps track of the mileage displayed on the car's instrument panel, as well as the actual mileage, calculated by hand. The correlation between actual mileage and displayed mileage is 0.71.
 - B) For a sample of packages, the correlation between weight and shipping time was 0.12.
 - C) In a sample of court cases, the correlation between the race of the defendant and whether or not the defendant was convicted was -0.44. *cat. var.*
 - D) The correlation between tail length and weight of cats is 0.67.
3. Which of the following relationships are likely to show a negative correlation? *as X ↑, Y ↓*
- I. The number of minutes third graders spend practicing multiplication and the number of minutes it takes third graders to complete a 50-question multiplication quiz.
 - II. The speed of a bicycle and the length of the skid mark when the brakes are applied.
- A) I only B) II only C) both I and II D) neither I or II
4. All of the pairs of variables below are positively correlated. Which one is unlikely to illustrate a cause-effect relationship?
- A) the number of pieces in a jigsaw puzzle; the time it takes to assemble the puzzle
 - B) total revenue generated by video arcades in the U.S.; number of computer science doctorates awarded in the U.S.
 - C) number of occupants in a house; annual usage of electricity, measured in kilowatt-hours
 - D) tree diameter; number of board feet of lumber
5. Variables X and Y have $r = 0.40$. If we decrease each X value by 0.1, double each Y value, and then interchange them (put X on the Y -axis and vice versa) the new correlation will be
- A) -0.40 B) 0.15 C) 0.40 D) 0.60
6. You collect data on the heights and weights (in inches and pounds, respectively) of male elementary school students, and find that the correlation between height and weight is 0.754. After you convert the heights to centimeters and the weights to kilograms, correlation...
- A) increases B) decreases C) remains the same D) cannot be determined

7. Which of the following is not a condition that must be checked before you can use correlation?

- ☒ A) The data must come from a random sample.
- ☐ B) Variables must be quantitative.
- ☐ C) The scatterplot must show a linear association.
- ☐ D) The scatterplot cannot show any outliers.

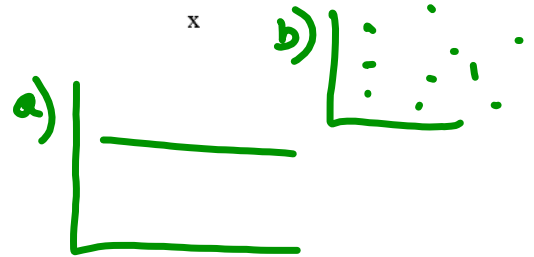
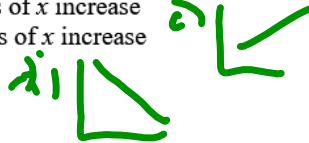
8. What is the correlation of the data shown, to the nearest hundredth?

- ☒ A) 1.00 B) 0.96 ☒ C) -0.96 ☒ D) -1.00



9. A negative correlation exists on a scatterplot when...

- ☐ A) values of y remain constant as values of x increase
- ☐ B) values of y change randomly as values of x increase
- ☐ C) values of y increase as values of x increase
- ☒ D) values of y decrease as values of x increase



10. Which phrase best represents the relationship between the duration of airline flight in hours and the number of gallons of jet fuel used?

- ☐ A) correlated, but not causal
- ☐ B) causal, but not correlated
- ☒ C) both correlated and causal
- ☒ D) neither correlated, nor causal

HW:

HWK: Stats Ch. 6 : Correlation
Worksheet