

Unit 6 Touchstones

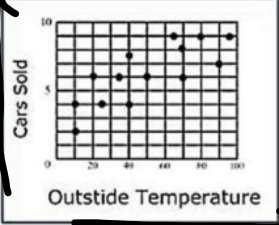
Touchstone 1 – Correlation and Causation

1. Complete the following statement to create a causal relationship: “the more the air conditioner runs...”

- A. the warmer it is outside.
- B. the cooler the house becomes.**
- C. the more people will buy ice cream.
- D. the more people sit on the couch.

2. Which statement BEST describes the relationship based on the graph?

- A. An increase in temperature causes an increase in cars sold.
- B. An increase in temperature causes a decrease in cars sold.
- C. An increase in temperature is correlated to an increase in cars sold.**
- D. An increase in temperature is correlated to a decrease in cars sold.



3. Which of the following relationships below show correlation only?

- A. the age of an adult and the adult's pant size.**
- B. An increase in sales of toys and an increase of money made in a toy store.
- C. The number of times suspended and the amount of school days missed.
- D. An increase in snow fall and the number of inches of snow reported.

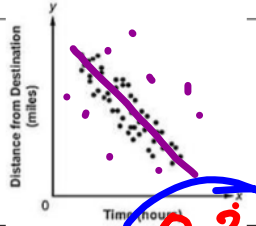
Touchstone 2 – Correlation and Line of Best fit

4. Which correlation coefficient would BEST describe the relationship between two variables that have a weak, positive correlation?

- A. 0.25**
- B. 0.63
- C. 0.84
- D. 0.99

5. What is the correlation coefficient of the data?

- ~~A. 1.42~~
- ~~B. 0.99~~
- C. -0.72**
- ~~D. -0.42~~



6. Which linear function is a good fit for the data in the given table?

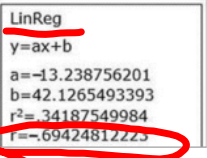
x	y
2	6
3	12
4	18
5	24
6	30
7	36
8	42
9	48
10	54

Handwritten calculations: $\frac{15-12}{3-2} = \frac{3}{1} = 3$ and $\frac{32-28}{6-5} = \frac{4}{1} = 4$. The slope 3 is circled in blue.

- A. $y = 5x + 2$**
- ~~B. $y = -5x + 2$~~
- ~~C. $y = 1/5x - 2$~~
- ~~D. $y = -1/5x - 2$~~

7. What does the screenshot show about the data set?

- ~~A. The data is best fit with a weakly correlated, positive slope line.~~
- ~~B. The data is best fit with a moderately correlated, positive slope line.~~
- ~~C. The data is best fit with a weakly correlated, negative slope line.~~
- D. The data is best fit with a moderately correlated, negative slope line.**



$r = -.7$ $y = -13.2x + 42.1$ $-.7$

Touchstone 3 – Interpreting Line of Best Fit

Value of Cars from Time of Sale

Age of Car (in months)	Value of Car
0	\$34,000
12	\$20,250
18	\$20,000
20	\$14,150
24	\$12,500
48	\$10,000

8. In this context, what does the slope of the linear function that models the data represent?

A. The original value of the car.
 B. The gain in value of the car.
 C. The loss in value of the car.
 D. The value of the car per month.

9. The scatterplot shows the number of hours of studying that students spent preparing for an exam and their scores on the exam and follows the linear model $y = 6.25x + 50.08$. In this context, what does the y-intercept of the best fit line represent?

A. For 0 hours spent studying, a student would earn an exam score of a 6.
 B. For 0 hours spent studying, a student would earn an exam score of a 50.
 C. For every hour spent studying, the exam score increases by about 6 points.
 D. For every hour spent studying, the exam score increases by about 50 points.

10. Suppose a randomly selected group of people reported their height and shoes size. Then, height (x, in inches) was used to predict shoe size. The linear regression line was found to be $y = 0.5x - 22$. Does it make sense to interpret the y-intercept in this model?

A. No, because no one has a height of 0 in.
 B. No, because -22 is too low of a shoe size estimate for someone with a height of 0 in.
 C. Yes, because you can make a prediction for anyone in the population of interest.
 D. Yes, because the sample was randomly selected.

Touchstone 4 – Bivariate Data

11. Ms. Rosenberg collects information about her students. She records students' favorite movie types in the table and separates the responses by age. What is the marginal relative frequency of 15-year-olds?

Age	Favorite movie genre			
	Comedy	Romantic comedy	Action	Thriller
15 years old	8	14	22	9
17 years old	13	16	18	5

A. .50 B. .38 C. .14 D. .26

12. Use the two-way frequency table shown. Given a student is between the ages of 14 to 17, what is the probability that the student will skip breakfast?

	Eat Breakfast	Skip Breakfast	Totals
Students ages 10 – 13	40	14	54
Students ages 14 – 17	12	24	36
Totals	52	38	90

A. 0.26 B. 0.33 C. 0.67 D. 0.88

13. What is the joint relative frequency of students who are 14-17 and skip breakfast?

	Eat Breakfast	Skip Breakfast
Students aged 10 – 13	40	14
Students aged 14 – 17	14	24

A. 0.27 B. 0.63 C. 0.67 D. 1.50

