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Indicate the answer choice that best completes the statement or answers the question.

	1	2	3	4	5	6	7	8	9	10
a										
b										
c										
d										
e										

A year-long fitness center study sought to determine if there is a relationship between the amount of muscle mass gained y (kilograms) and the weekly time spent working out under the guidance of a trainer x (minutes). The resulting least-squares regression line for the study is $y = 2.04 + 0.12x$.

1. We can see from the equation of the line that as the weekly time spent working out x goes up,
   a. muscle mass gained y tends to go up because the slope 2.04 is positive.
   b. muscle mass gained y tends to go up because the slope 0.12 is positive.

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c. muscle mass gained *y* tends to go down because the slope 0.12 is less than 2.04.

d. muscle mass gained *y* tends to go down, because the slope 0.12 is less than 52.

2. What can we say about the relationship between a correlation *r* and the slope *b* of the least-squares line for the same set of data?

a. *r* is always larger than *b*.

b. *r* and *b* always have the same sign (+ or –).

c. *b* is always larger than *r*.

d. *b* and *r* are measured in the same units.

e. Both C and D are correct.

3. The correlation between two variables *x* and *y* is –0.6. If we used a regression line to predict *y* using *x*, what percent of the variation in *y* would be explained?

a. 77%

b. –36%

c. 36%

d. –6%

e. 6%

4. A study of many countries finds a strong positive

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correlation between the life expectancy in a country and the number of Facebook users in the country. This means that

a. Facebook use is a major contributing cause of longer life.

b. life expectancy could be significantly increased by having more people start Facebook accounts.

c. in countries where life expectancy is high, the number of Facebook accounts tends to be low.

d. in countries where the number of Facebook accounts is low, life expectancy tends to be high.

e. None of the above is true. association is not correlation!

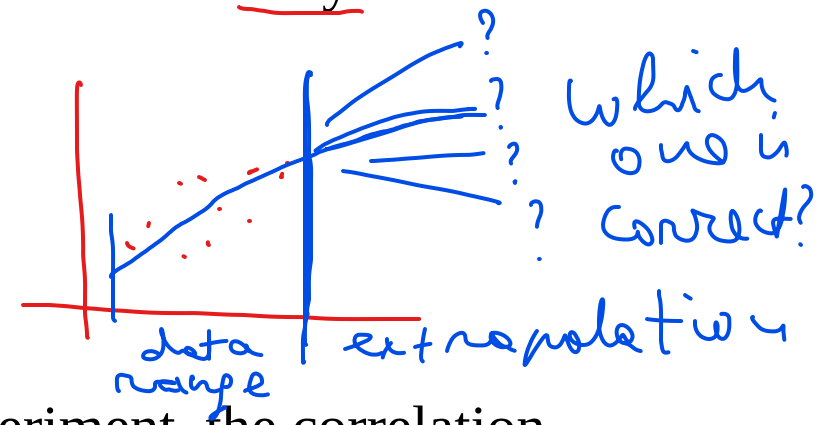
5. Using a regression line equation to make a prediction outside the range of the original data is risky due to

a. association.

b. extrapolation.

c. causation.

d. correlation.



In a fisheries researcher's experiment, the correlation between the number of eggs in the nest and the number of viable (surviving) eggs for a sample of nests is $r = 0.67$.

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6. The equation of the regression line for number of viable eggs y versus number of eggs in the nest x is $y = 0.72x + 17.07$. For a nest with 140 eggs, what is the predicted number of viable eggs?

a. 114 eggs
b. 116 eggs
c. 118 eggs
d. 120 eggs
e. None of the above

$y = 0.72 \cdot 140 + 17.07$

$= 117.87$

choose the closest option

A year-long fitness center study sought to determine if there is a relationship between the amount of muscle mass gained y (kilograms) and the weekly time spent working out under the guidance of a trainer x (minutes). The resulting least-squares regression line for the study is $y = 2.04 + 0.12x$.

7. Suppose you worked out for 2 hours (120 minutes) per week. How much muscle mass gain would you predict?

a. 14.40 kg
b. 750.84 kg
c. 16.44 kg
d. 18.48 kg
e. None of the above

$y = 2.04 + 0.12 \times 120$

$= 16.44$

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8. Deaths from highway accidents went down after the adoption of a national 55 miles-per-hour speed limit. Can we be confident that the lower speed limit caused the drop in deaths?

a. Yes, because the study was a randomized, comparative experiment.

b. No, because the effect of lower speed limits is confounded with the effect of better highways and safer cars.

c. Yes, because a drop in deaths over several years can't happen just by chance.

d. No, because of the placebo effect.

e. Yes, because correlation implies causation.

9. A study of 6600 men found that those who consumed a moderate amount of alcohol (one drink or less per night) have lower mortality (on the average) than those who drink none. Is this good evidence that drinking a moderate amount *causes* lower mortality?

a. Yes, because the study is an experiment.

b. No, because people who drink a moderate amount may differ from nondrinkers in other ways, such as income and exercise, that affect mortality.

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c. Yes, because the sample is so large that the margin of error will be quite small.

d. No, because we can't generalize from 6600 people to the millions of adults in the country. ?

10. If the least-squares regression line for predicting y from x is $y = 500 - 20x$, what is the predicted value of y when $x = 10$?

a. 300
b. 500
c. 4800
d. 700
e. 20

$y = 500 - 20x$

$= 500 - 20 \cdot 10$

$= 300$

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Answer Key

1. b

2. b

3. c

4. e

5. b

6. c

7. c

8. b

9. b

10. a