

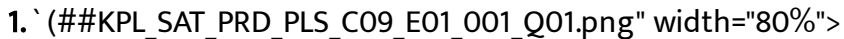


MATHS

BOOKS - KAPLAN INC MATHS (ENGLISH)

SCATTERPLOTS

How Much Do You Know

1. ` (##KPL_SAT_PRD_PLS_C09_E01_001_Q01.png" width="80%">

The scatterplot shows the prevalence of obesity plotted against the prevalence of diabetes in various areas of the United States. Which of the following best estimates the average rate of change in the prevalence of diabetes as compared to the prevalence of obesity ?

A. 0.3

B. 0.9

C. 1.1

D. 3

Answer: A



Watch Video Solution

2.

(###KPLSATPRDPLSC09E01002 - Q01.png width=80% > W ∈ dχll,

≠ feelswhenoutsidebasedontheactualtemperature and thew ∈ dspeed,

0[^](@)F, what is the approximate wind chill at 40 miles per hour based on the 2001 formula ?

A. $-20^{\circ} F$

B. $-30^{\circ} F$

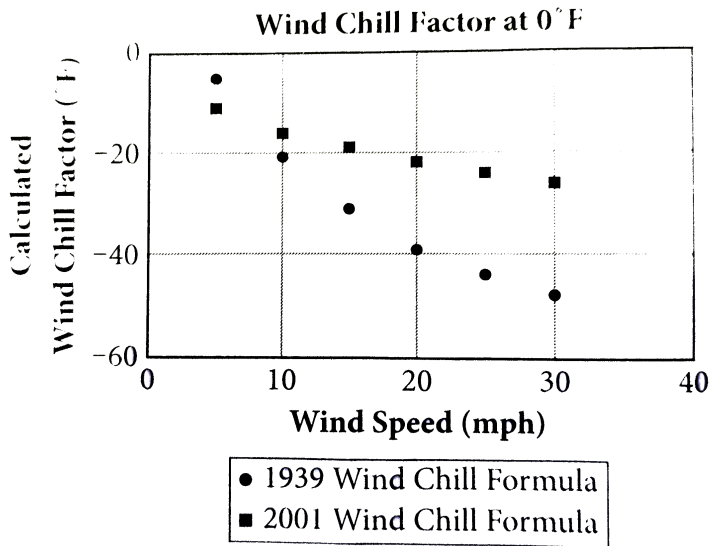
C. $-40^{\circ} F$

D. $-50^{\circ} F$

Answer: B



Watch Video Solution



3.

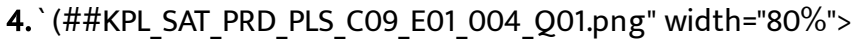
What wind speed would produce the same wind chill using the 1939 formula as the wind chill produced using the 2001 formula when the outside temperature is $0^{\circ}F$ and the wind speed is 40 miles per hour?

- A. 10 miles per hour
- B. 15 miles per hour
- C. 20 miles per hour
- D. 40 miles per hour

Answer: B



Watch Video Solution

4. ` (##KPL_SAT_PRD_PLS_C09_E01_004_Q01.png" width="80%")>

The scatterplot above shows data collected each year after the British Parliament enacted a mandatory seat belt law and line of best fit to the data. Which of the following equations best represents the trend of the data shown in the figure ?

A. $y = 0.4x + 25$

B. $y = 1.8x + 15$

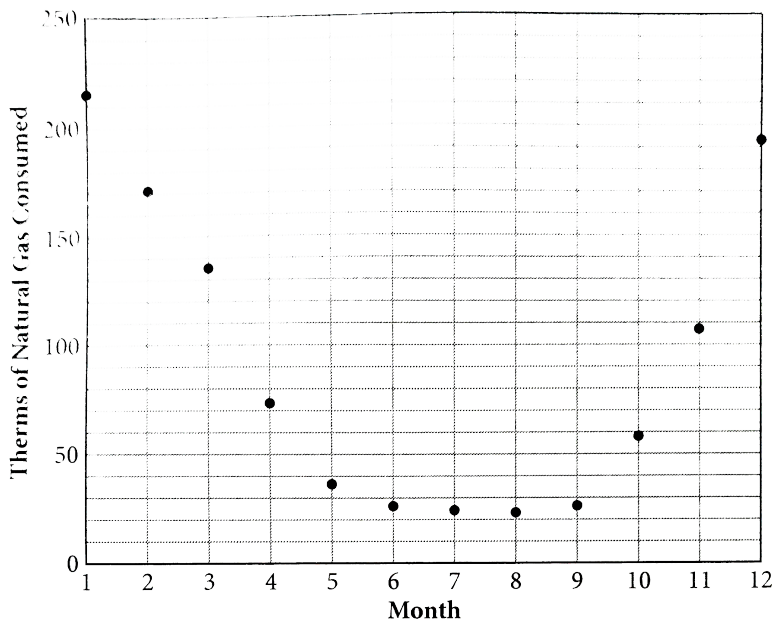
C. $y = 2.1x + 35$

D. $y = 2.6x + 25$

Answer: D



Watch Video Solution



5.

The scatterplot above shows the average terms of natural gas used by residential consumers over a 12-month period. Of the following equations, which best models the data in the scatterplot ?

A. $y = 1.061^x + 312.9$

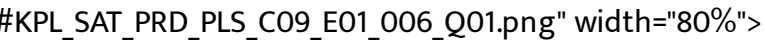
B. $y = -1.061^x - 312.9$

C. $y = 6.1x^2 - 85.1x + 312.9$

D. $y = -6.1x^{21} + 85.1x - 312.9$

Answer: C



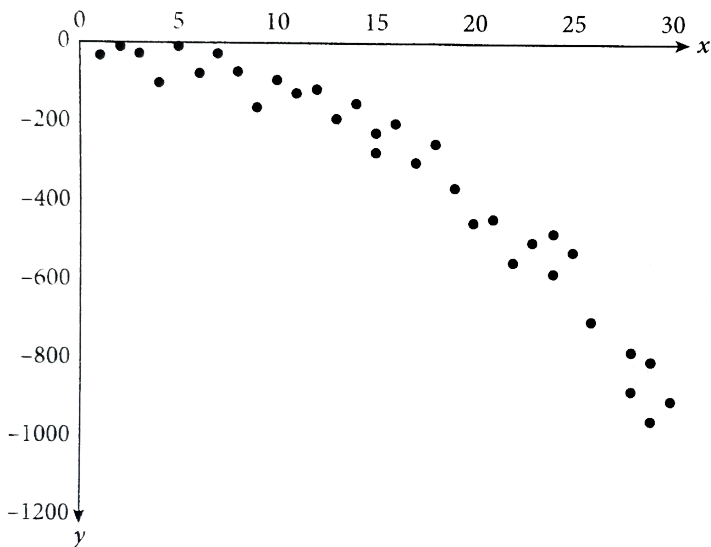
6. 

Scientists measured the concentration of an experimental medication in blood samples over time. If a quadratic function is used to model the data, which of the following best explains the meaning of the vertex?

- A. The average maximum medicine concentration in the blood sample is 7.5 units.
- B. The average maximum medicine concentration is more than 20 units.
- C. The average maximum medicine concentration in the blood samples occurs around 2.5 minutes.
- D. The average maximum medicine concentration in the blood sample occurs between 5 and 10 minutes.

Answer: D





7.

For which of the following values of a and b does the equation $y = ax^b$ model the data in the scatterplot above?

- A. $a < 0, b < 0$
- B. $a < 0, b > 0$
- C. $a > 0, b < 0$
- D. $a > 0, b > 0$

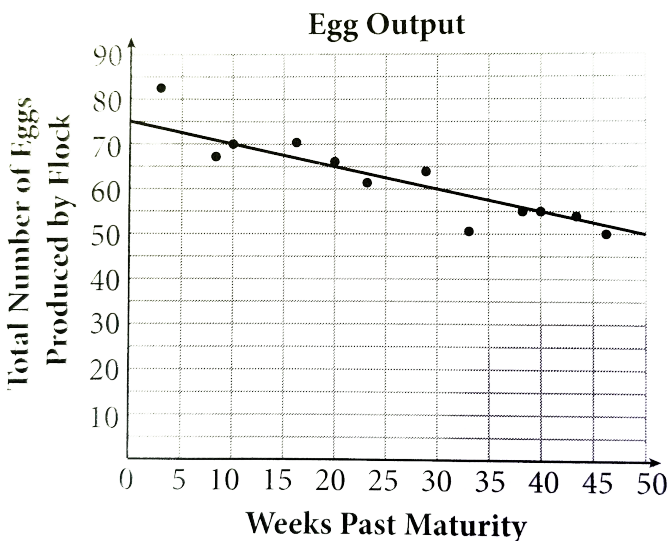
Answer: B



Watch Video Solution

Try On Your Own

1. Most chickens reach maturity and begin laying eggs at around 20 weeks of age. From this point forward, however, as the chicken ages, its egg production decreases. A farmer was given a flock of 100 chickens (all of which were the same age) and asked to measure daily egg output for the entire flock at random intervals starting at maturity until the chickens were 70 weeks old. The data are recorded in the scatterplot below and the line of best fit has been drawn.



Based on the line of best fit, what is the predicted number of eggs that will be produced by the flock when it is 33 weeks past maturity ?

A. 33

B. 50

C. 58

D. 64

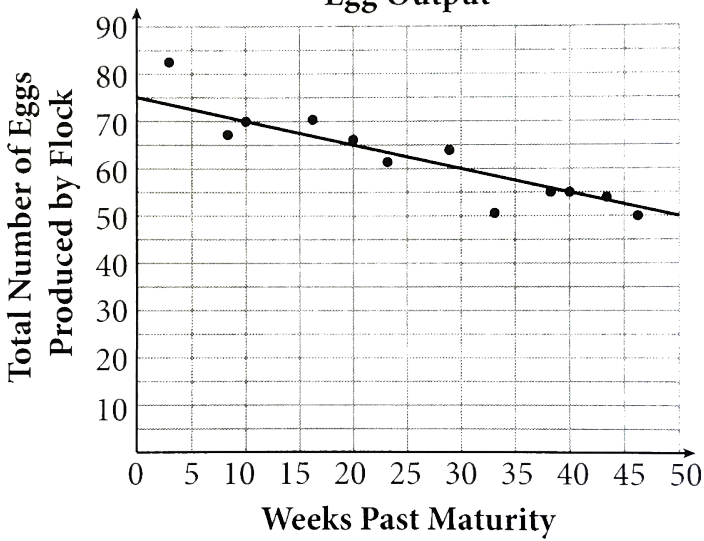
Answer: C



Watch Video Solution

2. Most chickens reach maturity and begin laying eggs at around 20 weeks of age. From this point forward, however, as the chicken ages, its egg production decreases. A farmer was given a flock of 100 chickens (all of which were the same age) and asked to measure daily egg output for the entire flock at random intervals starting at maturity until the chickens were 70 weeks old. The data are recorded in the scatterplot below and the line of best fit has been drawn.

Egg Output

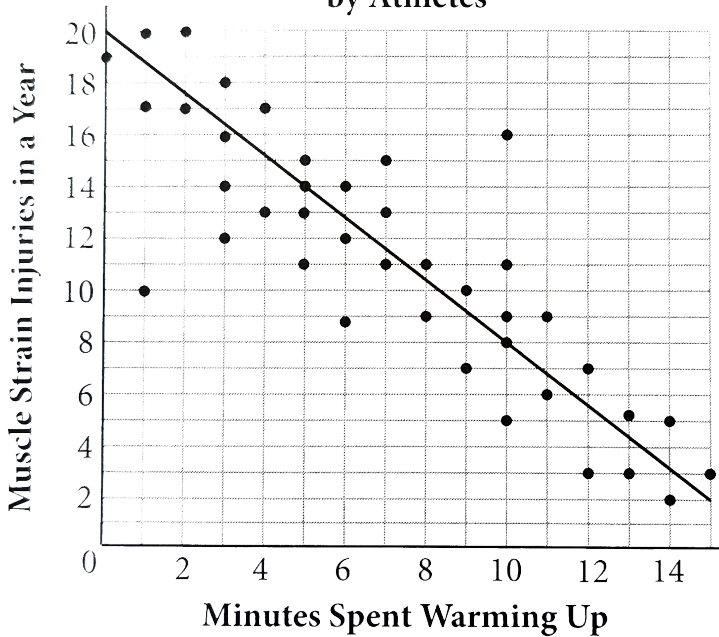


How many times did the farmer's data differ by more than 5 eggs from the number of eggs predicted by the line of best fit ?



[Watch Video Solution](#)

Minor Muscle Strains Sustained by Athletes



3.

The scatterplot above shows the number of minor muscle strain injuries sustained in a year by athletes, plotted against their self-reported amount of time spent stretching and doing other "warm up" activities before energing in rigorous physical activity. Which of the following best estimates the average rate of change in the number of injuries compared with the number of minutes spent warmig up ?

A. -1.2

B. -0.8

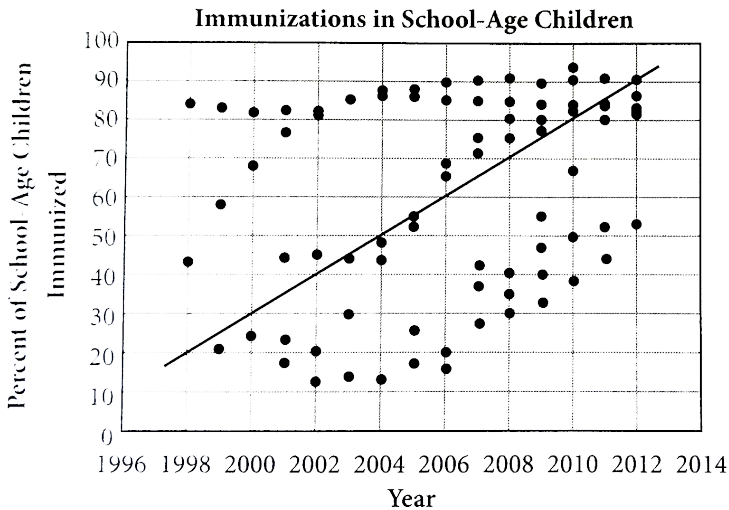
C. 2

D. 20

Answer: A



Watch Video Solution



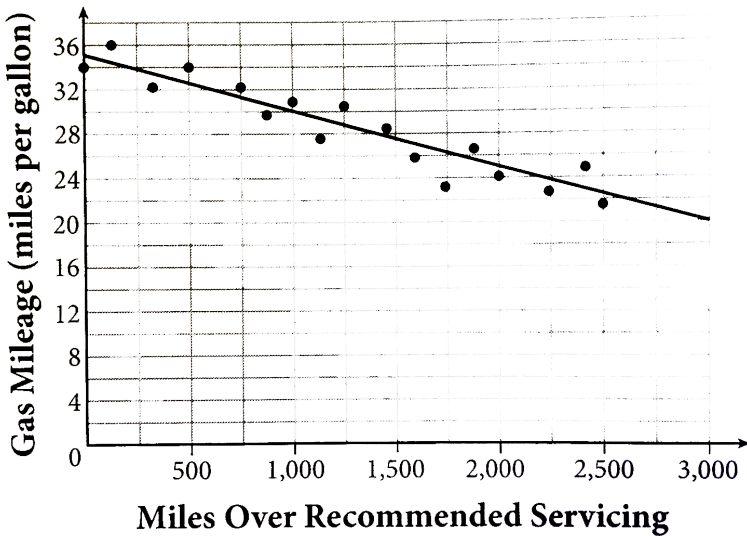
4.

The graph above shows the percent of school-age children in the United States who received immunization for various illnesses between 1996 and 2012. What was the average rate of increase in the percent of children immunized per year over the given time period ?

- A. 5 percent per year
- B. 10 percent per year
- C. 25 percent per year
- D. 70 percent per year

Answer: A

 [Watch Video Solution](#)

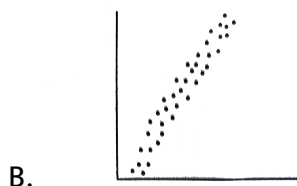
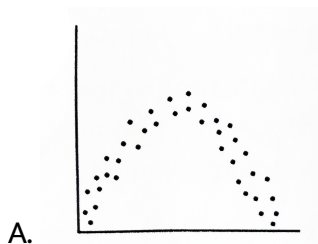


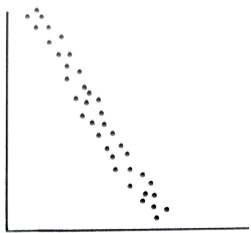
A car manufacture compiled data that indicated gas mileage decreased as the number of miles driven between recommended servicing

increased. The manufacture used the equation $y = -\frac{1}{200}x + 35$ to model the data. Based on the information, how many miles per gallon could be expected if this particular car is drive 3,400 miles over the recommended miles between servicing ?

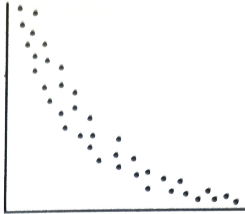
 [Watch Video Solution](#)

6. Which of the following is best modeled using a linear regression equation, $y = ax + b$, where $a < 0$?





C.



D.

Answer: C



Watch Video Solution

7. Adriana used the data from a scatterplot she found on the U.S. Census Bureau's website to determine a regression model showing the relationship between the population in the area where she lived and the number of years, x , after she was born. The result was an exponential growth equation of the form $y = x_0(1 + r)^x$. Which of the following does x_0 most likely represent in the equation ?

- A. The population in the year that she was born
- B. The rate of change of the population over time
- C. The maximum population reached during her lifetime
- D. The number of years after her birth when the population reached its maximum

Answer: A



Watch Video Solution

8. Suppose a scatterplot shows a weak negative linear correlation. Which of the following statements is true ?

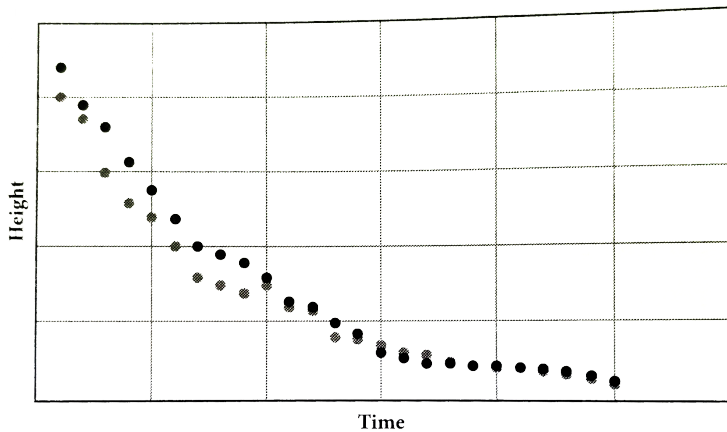
- A. The slope of the line of best fit will be a number less than -1.
- B. The slope of the line of best fit will be a number between -1 and 0.
- C. The data points will follow, but not closely, the line of best fit, which has a negative slope.

D. The data points will be closely gathered around the line of best fit,

which has a negative slope.

Answer: C

 [Watch Video Solution](#)



9.

A drain at the bottom of a cylindrical water tank is opened and the height of the water is measured at regular time intervals. The tank is refilled and the process is then repeated. The scatterplot above shows the measured height on the y-axis and time on the x-axis for the trials.

Which of the following conclusions can be drawn from the observations in the scatterplot?

- A. Water flows out of the drain at a constant rate.
- B. The flow rate from the tank decreases as the height of the water in the tank decreases.
- C. The drain is inefficiently designed.
- D. There is no relationship between the height of the water in the tank and time.

Answer: B



Watch Video Solution

10. Student in a finance class surveyed 20 percent of the account holders at Docven Bank to determine whether the bank's "Stock Market Special" savings account actually paid account holders the promised 10 percent annual interest rate. The scatterplot above shows the data the students collected from account holders about how long ago they opened their accounts and their current balances. The students calculated a line of

best fit with the equation $y = 120\left(1 + \frac{.08}{12}\right)^{12x}$, which means that the bank was actually paying account holders only an 8 percent annual interest rate. Which of the following best explains how the number 120 in the equation relates to the scatterplot?

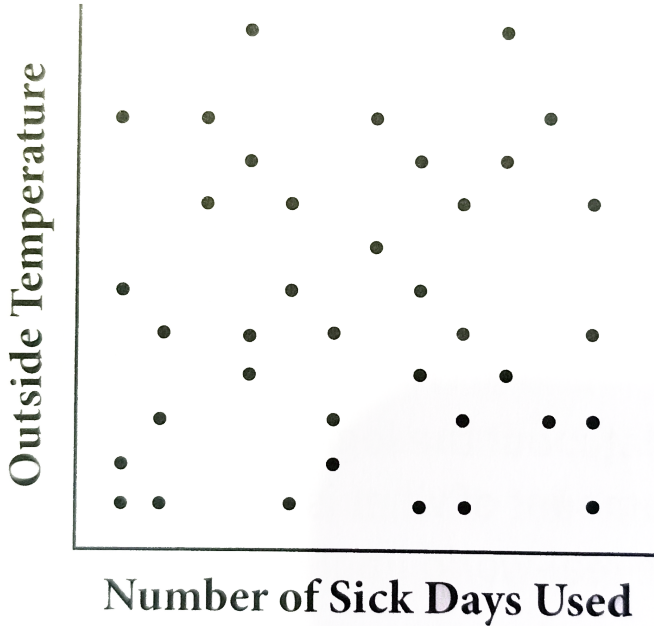
- A. A "Stock Market Special" account with \$120 initially will likely have less than \$350 after 15 years.
- B. All "Stock Market Special" accounts started with a \$120 initial investment.
- C. The difference between the promised 10 percent annual interest rate and the actual 8 percent rate is \$120 a year.
- D. A "Stock Market Special" account with \$120 initially will likely have more than \$350 after 15 years.

Answer: D



Watch Video Solution

Employee Sick Day Usage



11.

The Human Resources department of a company tracks employee sick day usage to see if there are patterns. One of the HR representatives decides to check employee sick day usage against outside temperature. He compiles the information for the employees' sick day usage and temperature in the scatterplot above.

Which of the following conclusion can he draw based on this data ?

- A. There is no relationship between the number of sick days used by employees in general and outside temperature.

- B. There is no relationship between the number of sick days used by this company's employees and outside temperature.
- C. No conclusions can be drawn about the number of sick days used by this company's employees and outside temperature.
- D. There is a relationship, but not a causal link, between the number of sick days used by this company's employees and outside temperature.

Answer: B



[Watch Video Solution](#)

12. Scientists plotted data for two animal populations on a scatterplot: population A, which they graphed along the x-axis, and population B, which they graphed along the y-axis. The data showed a strong negative correlation. Which of the following statements is justified ?

- A. The rise in population A caused the decline in population B.

B. The decline in population B caused the rise in population A.

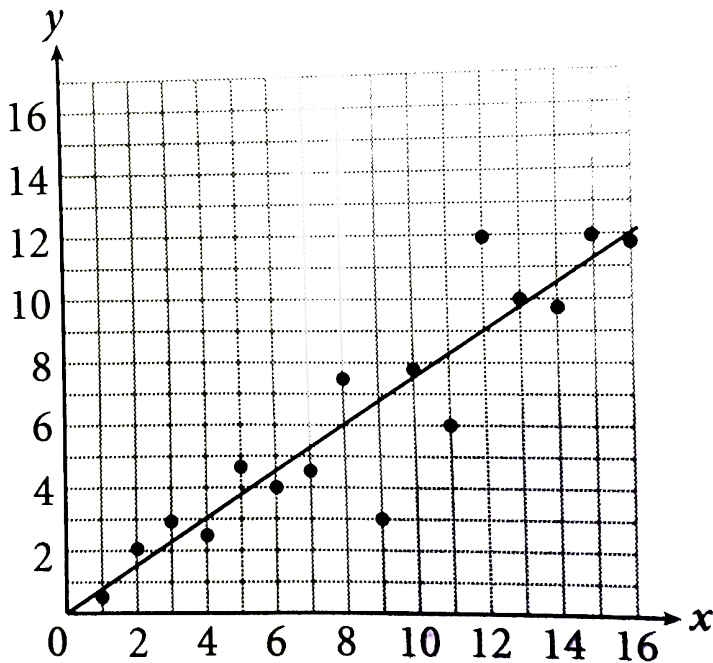
C. Because the correlation is negative, there cannot be causation between the two populations.

D. The rise in population A is correlated to the decline in population B, but causation is unknown.

Answer: D



Watch Video Solution

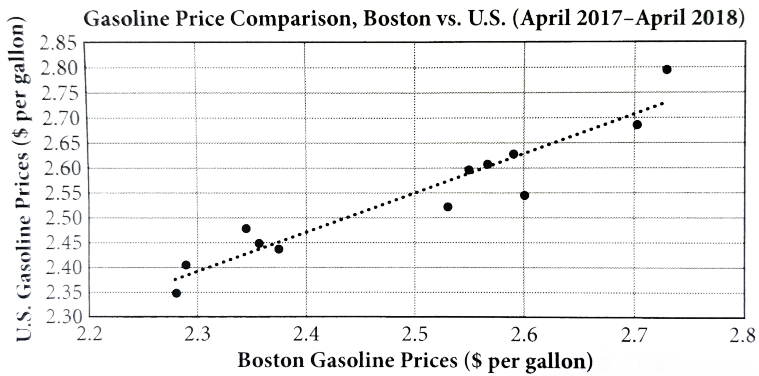


13.

By what percent does the y-coordinate of the data point (12,12) deviate from the y-value predicted by the line of best fit for an x-valued of 12? (Ignore the percent sign and grid your response to the nearest percent.)

 [Watch Video Solution](#)

14. The scatterplot below compares the average gasoline prices in Boston, per gallon, to the average gasoline prices across the United States, per gallon, during a one-year period from 2017 to 2018.



Of the following equations, which best models the data in the scatterplot ?

A. $y = -1.7848x + 0.5842$

B. $y = 1.7848x + 1.5842$

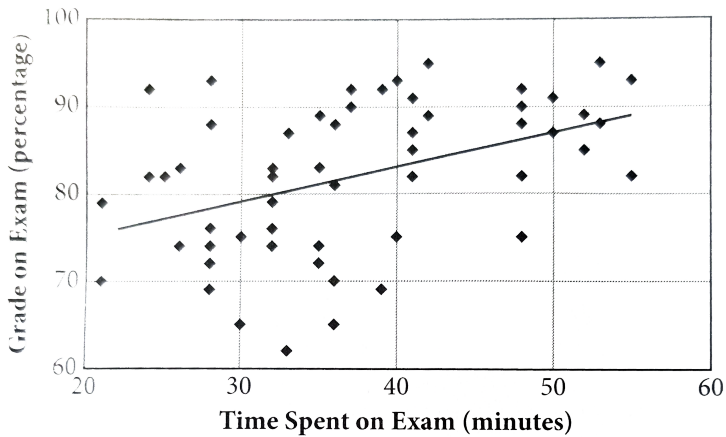
C. $y = 0.7848x + 0.5842$

D. $y = -0.7848x + 0.5842$

Answer: C



Watch Video Solution

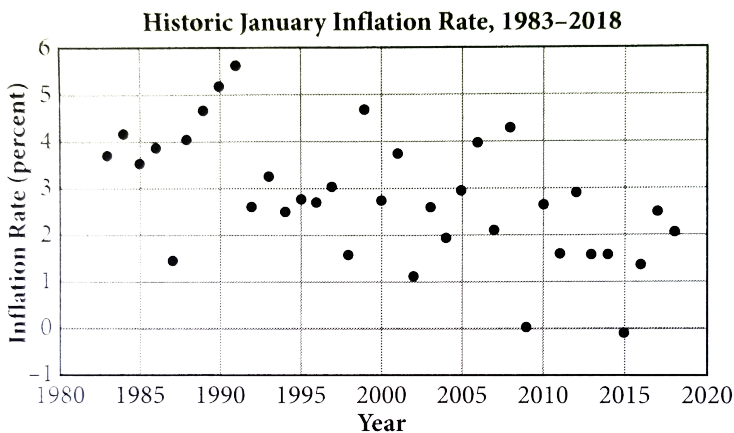


15.

A physics professor presented the scatterplot above to her first-year students. What is the significance of the slope of the line of best fit ?

- A. The slope represents the rate at which time spent on an exam increases based on a student's exam performance.
- B. The slope represents the average grade on the exam.
- C. The slope represents the rate at which a student's exam grade increases based on time spent on the exam.
- D. The slope has no significance.

Answer: C

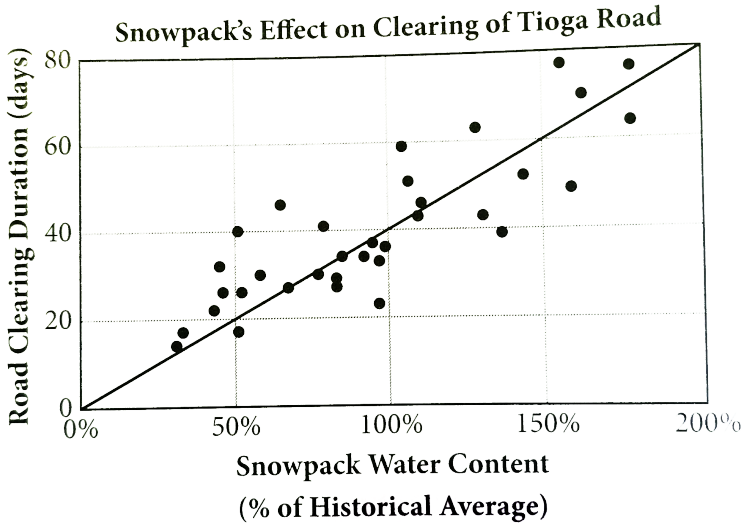


16.

Which of the following is the most accurate statement about the scatterplot above ?

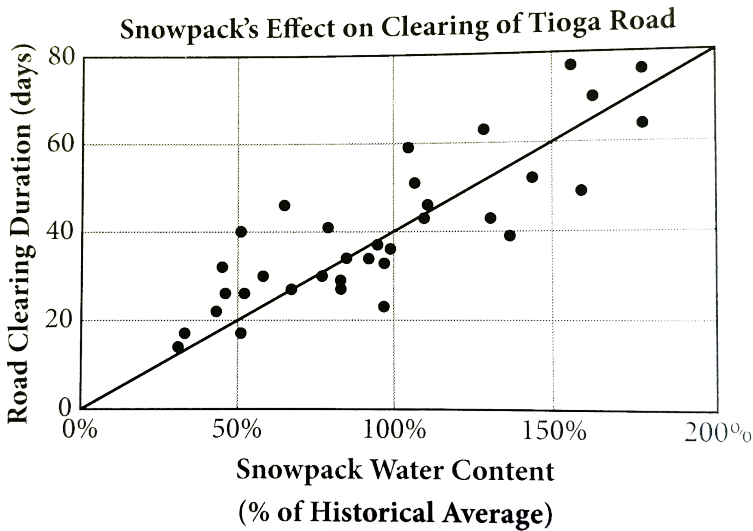
- A. The data in the scatterplot has a weak positive correlation.
- B. The data in the scatterplot has a strong positive correlation.
- C. The data in the scatterplot has a negative correlation.
- D. There is no correlation in the data set.

Answer: C



Tioga Road is a mountain pass that crosses the Sierra Nevada through northern Yosemite National Park. The road is closed from about November through late May. This time period can change depending on the quantity and nature of the season's snowfall, as well as unforeseen obstacles such as fallen trees or rocks. The scatterplot above compares the snowpack water content on April 1 (for year 1981-2014) as a percent of the historical average to the time it takes the National Park Service to fully clear the road and open it to traffic.

For every 5 percent increases in snowpack water content, how many more days does it take the National Park Service to clear Tioga Road ?



18.

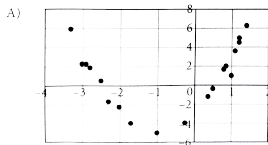
Tioga Road is a mountain pass that crosses the Sierra Nevada through northern Yosemite National Park. The road is closed from about November through late May. This time period can change depending on the quantity and nature of the season's snowfall, as well as unforeseen obstacles such as fallen trees or rocks. The scatterplot above compares the snowpack water content on April 1 (for year 1981-2014) as a percent of the historical average to the time it takes the National Park Service to fully clear the road and open it to traffic.

Assuming no unforeseen obstacles or machinery issues, if the road's snowpack water content on April 1 is 248 percent of the historical

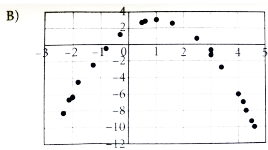
average, based on the prior experience shown on the graph, how many days will it take to fully clear Tioga Road ?

 [Watch Video Solution](#)

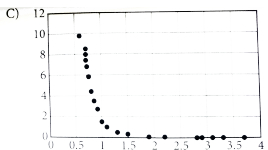
19. Which of the following scatterplots shows a relationship that is appropriately modeled with the equation $y = -ax^2 + bx - c$, where a and c are negative and b is positive ?



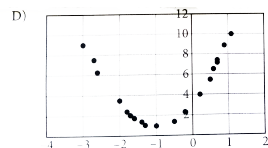
A.



B.



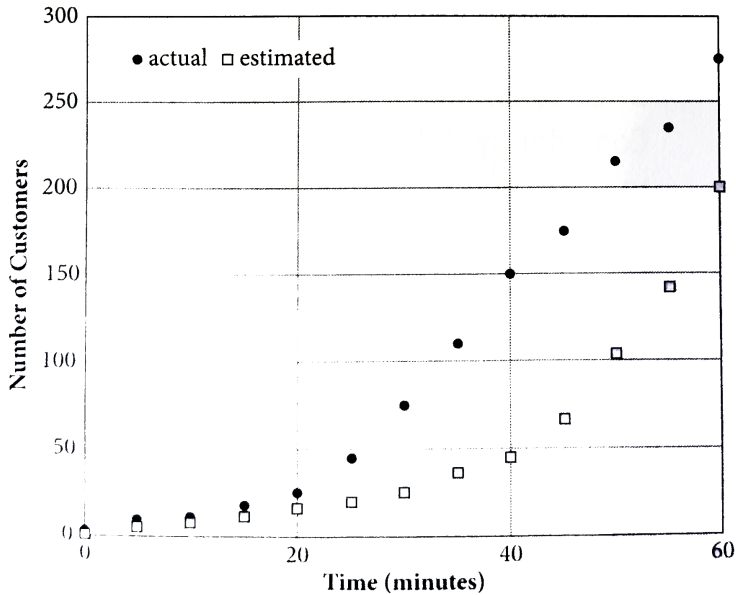
C.



D.

Answer: D

 Watch Video Solution



20.

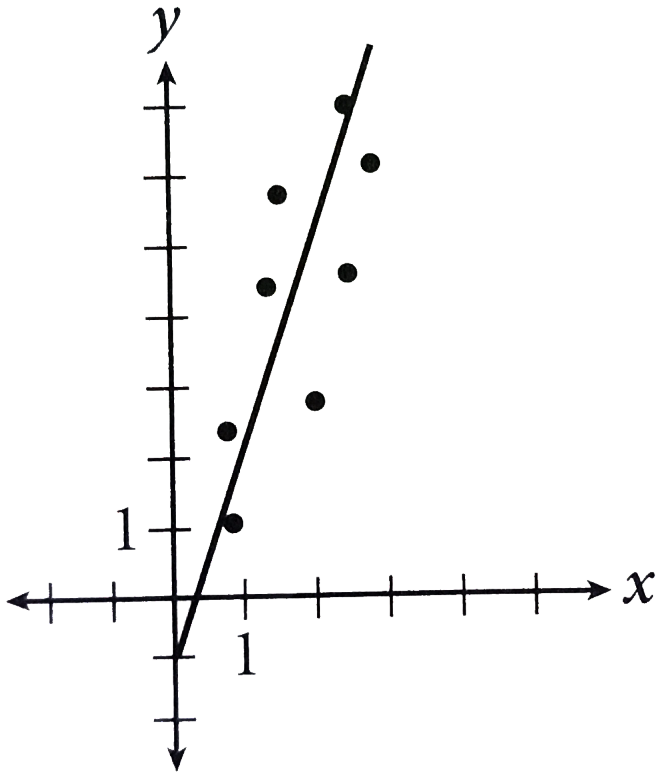
The scatterplot above shows the actual and estimated number of customers visiting a new shopping plaza within the first hour of opening. Which of the following statements correctly compares the rates of increase for the actual and estimated numbers of customers ?

- A. The rate of increases for the actual number of customers is greater than that of the estimated number in every 20-minute interval.
- B. The rate of increase for the actual number of customers is less than that of the estimated number in every 20-minute interval.
- C. The rate of increases for the actual number of customers is greater than that of the estimated number in the interval from 20 to 40 minutes and less in the interval 40 to 60 minutes.
- D. The rate of increase for the actual number of customers is less than that of the estimated number in the interval from 20 to 40 minutes and greater in the interval 40 to 60 minutes.

Answer: C



[Watch Video Solution](#)



1.

Which of the following equation corresponds to the line of best fit for the data set shown above ?

A. $y = 0.4x - 1$

B. $y = 0.4x + 1$

C. $y = 2.5x + 1$

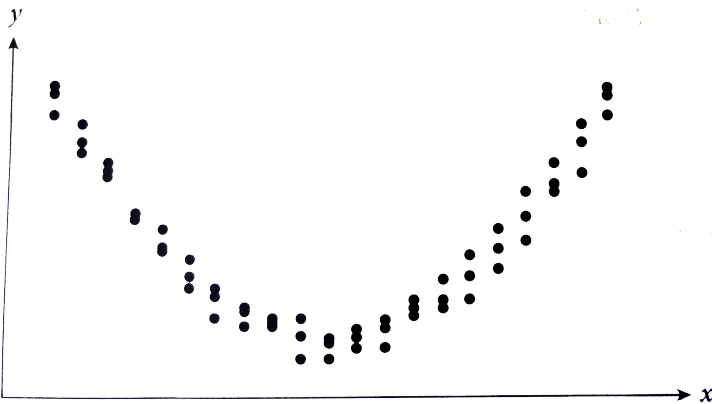
D. $y = 2.5x - 1$

Answer: D



Watch Video Solution

Scatterplot Modeling



1.

Given that $a, b,$ and c are constants and that $a > 0,$ which of the following is the equation for the line of best fit for the above scatterplot

?

A. $y = ax + b$

B. $y = a^{bx}$

C. $y = -ax^2 + bx + c$

D. $y = ax^2 + bx + c$

Answer: D



Watch Video Solution