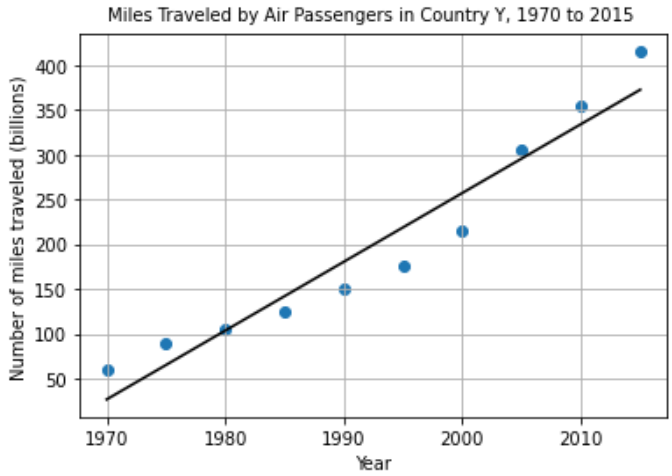
Date Completed: _____
Mentor Initials: _____

Lines of Best Fit and Scatter Plots

Multiple Choice

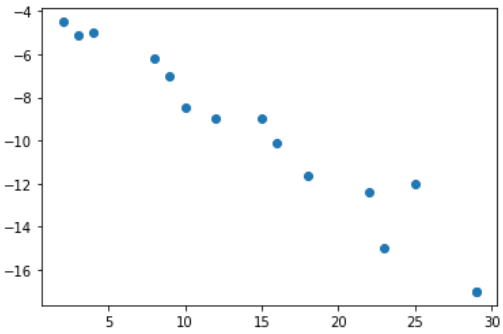
1. According to the line of best fit in the scatterplot below, which of the following best approximates the year in which the number of miles traveled by air passengers in Country Y was estimated to be 275 billion?



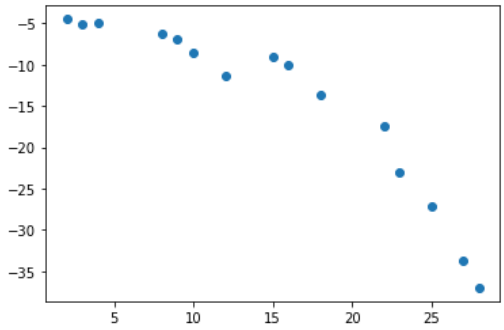
A) 1998
B) 2000
C) 2003
D) 2007

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

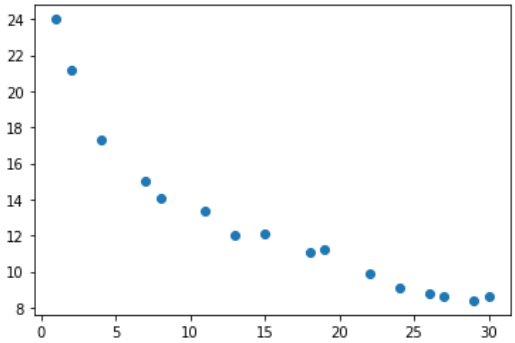
A)



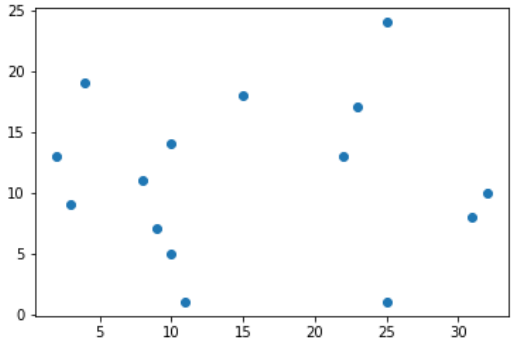
B)



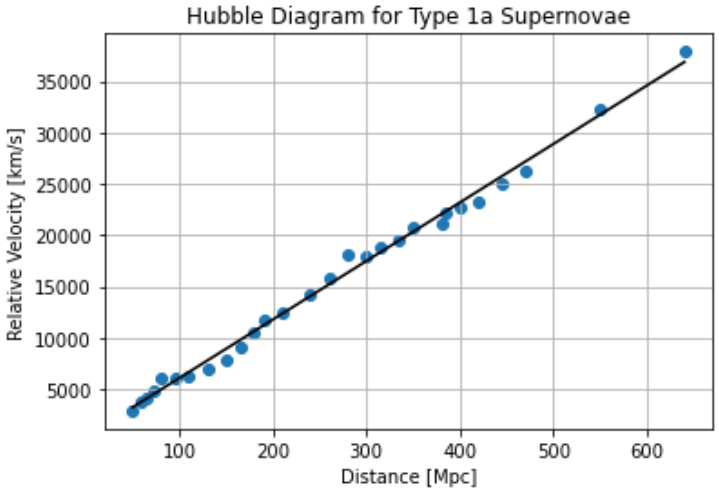
C)



D)



Questions 3 and 4 both refer to the following figure.



The scatterplot above shows the relative velocities, in kilometers per second (km/s), of many Type 1a Supernovae (relative to Earth) and their distances, in megaparsecs (Mpc), from Earth. The line of best fit is also shown.

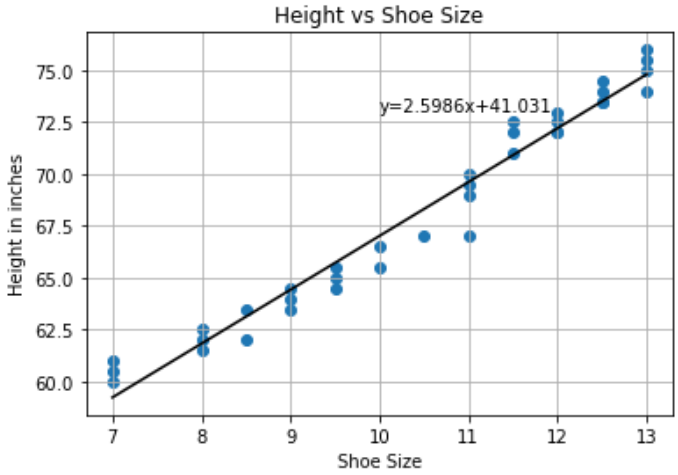
3. According to the scatterplot, which of the following statements is true about the relationship between a Supernova's distance from Earth and its relative velocity?

A) Supernovae that are more distant from Earth tend to have greater relative velocities.
B) Supernovae that are more distant from Earth tend to have lesser relative velocities.
C) The relative velocity of a Supernova that is twice as far from Earth as another Supernova is half the velocity of that of other Supernovae.
D) The distance from Earth to a Supernova is unrelated to the Supernova's relative velocity.

4. An astronomer observes a new Type 1a Supernova that is about 350 Mpcs from Earth. According to the line of best fit, which of the following best approximates the relative velocity of the Supernova, in km/s?

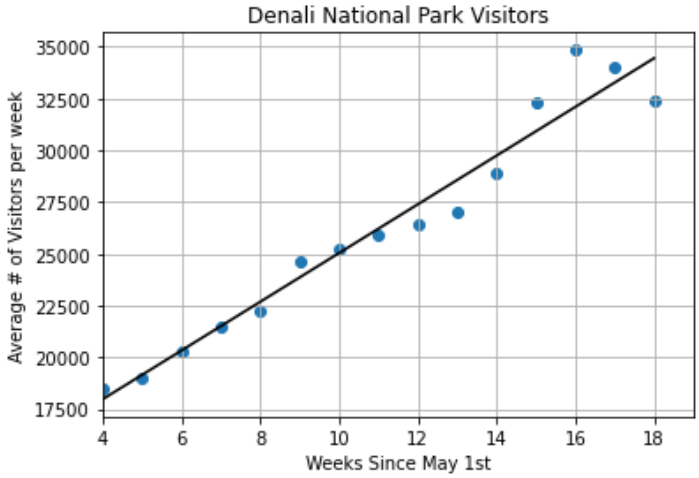
A) 18,000
B) 21,000
C) 25,000
D) 27,000

5. The scatterplot below shows data collected on the measured heights of students at a local high school as well as their shoe size. A line of best fit for the data is also shown. Based on the line of best fit, if the shoe size of a new student is 14, what would you predict their height, in inches, to be?



A) 36.380
B) 41.031
C) 55.627
D) 77.411

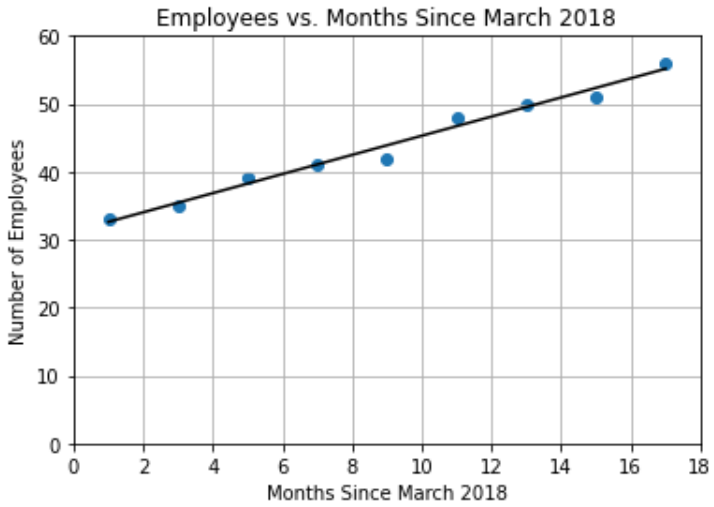
6.



For the scatterplot and line of best fit shown above, which of the following below best approximates the equation for the line of best fit?

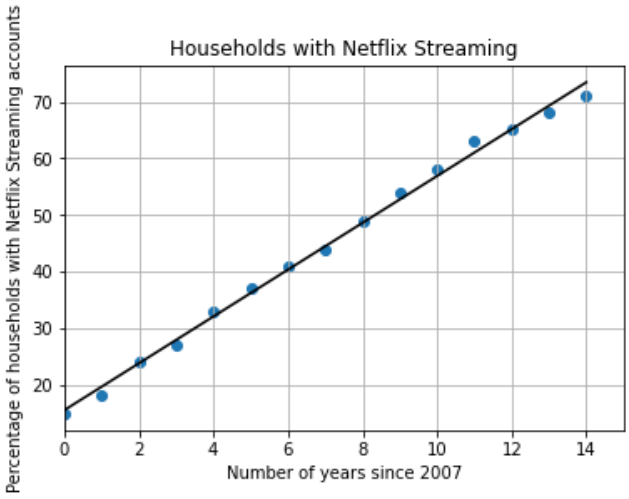
A) $y = 16x + 4$
B) $y = 16x$
C) $y = 4x - 16$
D) $y = 4x + 16$

7. A mid-size company has seen very rapid growth over the past couple of years. Executives wish to analyze this growth and plot the number of employees vs. time, in months since March 2018, as shown below. The equation of the line of best fit is $y = 1.4083x + 31.2139$. Which of the following is the best interpretation of the number 1.4083 in the context of the problem?



A) The number of employees at the company in March of 2018.
B) The average number of employees over the period the data was recorded.
C) The average monthly increase in employees over the period.
D) The months required to increase the number of employees by 1.

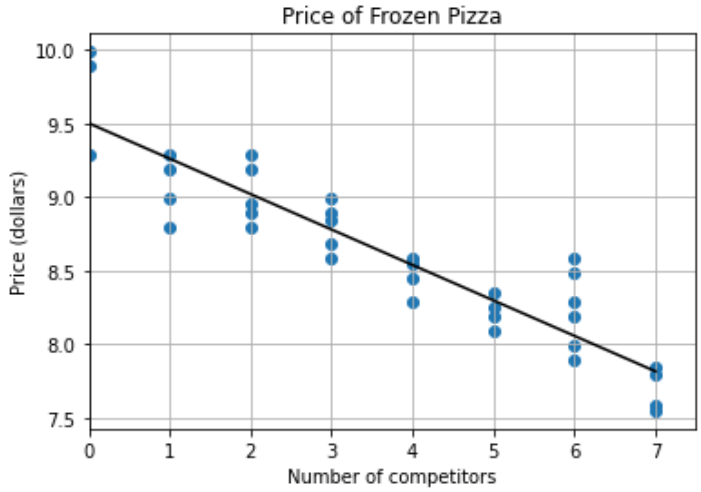
8.



For the scatterplot and line of best fit shown above, which of the following below best approximates the equation for the line of best fit?

A) $y = .0008x + 18500$
B) $y = .0008x + 13000$
C) $y = 1200x + 18500$
D) $y = 1200x + 13000$

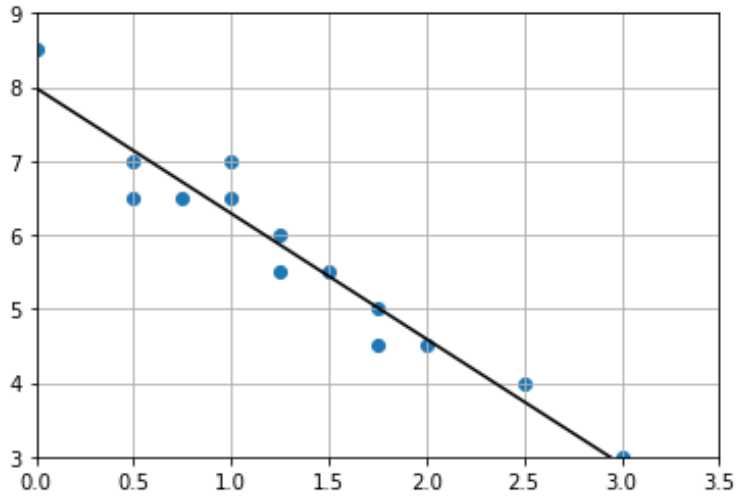
9. A researcher is investigating the relationship between the price of a popular frozen pizza at a grocery store and the number of competitors the store has. She defines a store's competitor as another similar store within a 3-mile radius of the store she selects. She selects 35 grocery stores across a state at random, and for each store, she records the number of competitors and its price for the frozen pizza. The results are shown, along with the line of best fit, in the scatterplot below.



Another grocery store in the same state sells the same frozen pizza for $8.50. If the store's price is more than that predicted by the line of best fit, what is the least number of competitors the store could have?

A) 4
B) 5
C) 6
D) 7

10.

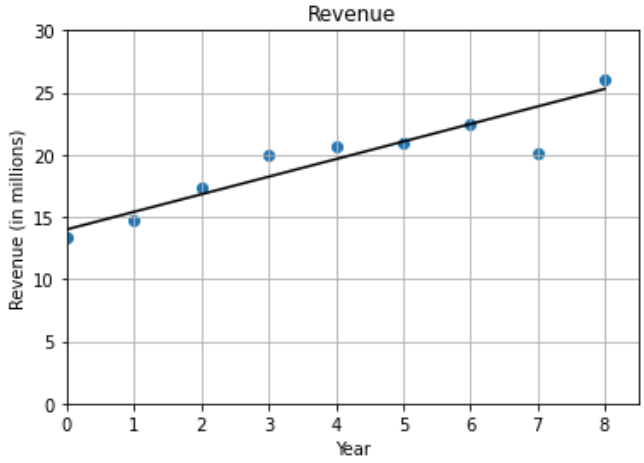


The scatterplot above shows 14 values from a data set. A line of best fit for the data is also shown. Which of the following is the best interpretation of the y-coordinate of the y-intercept of the line of best fit?

A) For the value $x = 8$, the line of best fit predicts the corresponding y-value to be approximately 0.
B) For the value $x = 0$, the line of best fit predicts the corresponding y-value to be approximately 8.
C) For the value $y = 0$, the line of best fit predicts the corresponding x-value to be approximately 3.
D) For the value $y = 3$, the line of best fit predicts the corresponding x-value to be approximately 0.

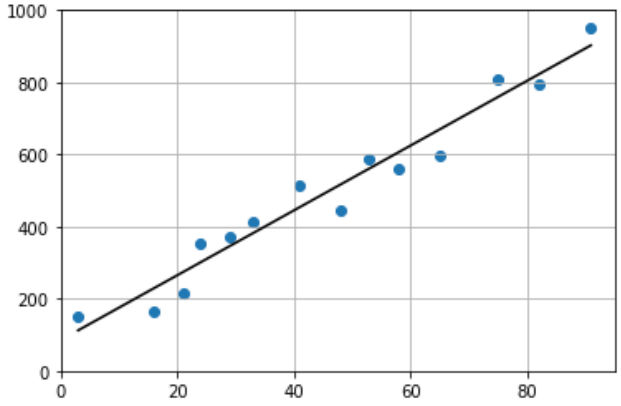
Grid-In

11.



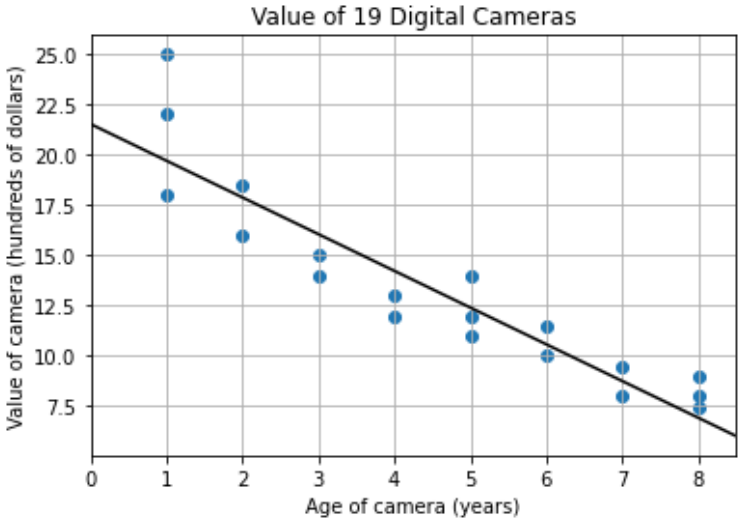
The scatterplot above shows the revenue, in millions of dollars, that a company earned over several years and a line of best fit for the data. In year 7, the difference between the predicted revenue and actual revenue is n million dollars, where n is a positive integer. What is a possible value of n? Round your answer to the nearest whole number. (Disregard the $ sign.)

12.



The scatterplot above shows 14 data points, along with a line of best fit for the data. For how many of the data points does the line of best fit predict a y-value that is less than the actual y-value?

Questions 13 and 14 both refer to the following information.

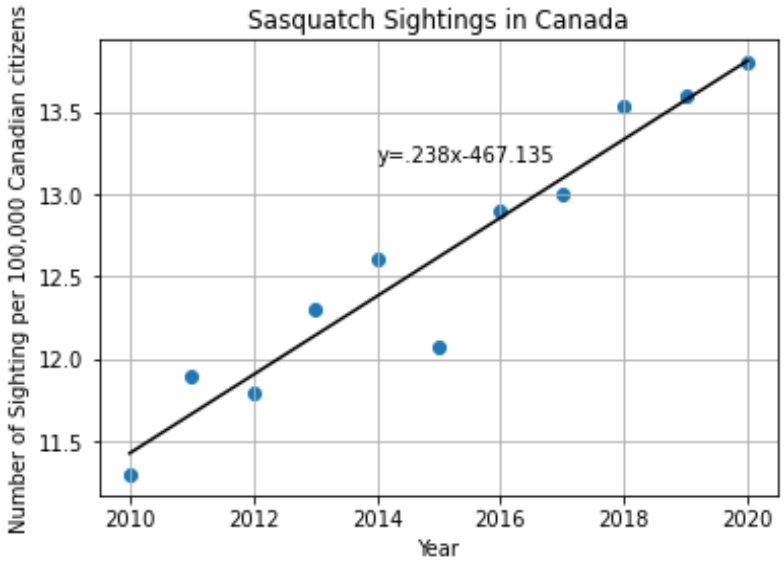


An electronics retailer has 19 digital cameras of a certain class in stock. The scatterplot above shows the value and age for each of the 19 cameras. A line of best fit for the data is also shown.

13. Based on the line of best fit, the estimated value of a 5-year-old camera is k hundred dollars. What is the value of k? (Round to one decimal)

14. What is the number of cameras for which the line of best fit predicts a value less than the actual value?

15.



The figure above shows the number of Sasquatch sightings, per 100,000 citizens, in Canada over the previous decade. Using the line of best fit, in what year would we predict the number of sightings to first exceed 15 per 100,000?

Bonus: Should Canada be alarmed and declare a state of emergency at this point? (Yes/No)