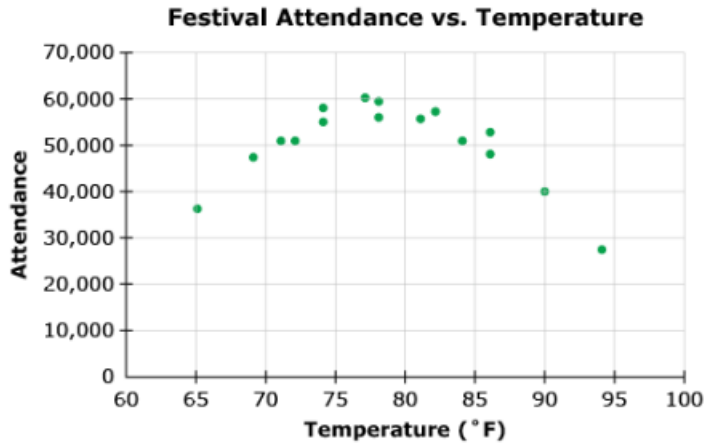
Level 4: Statistics and Probability Posttest Answer Key

Question 1:

Simone is planning an outdoor festival and wants to know how weather might affect attendance. The scatter plot below compares the daytime high temperature with attendance over the past sixteen years.



Which of the following **best** describes the relationship between temperature and attendance?

a. positive linear association

b. negative linear association

c. non-linear association

d. no association

Continue

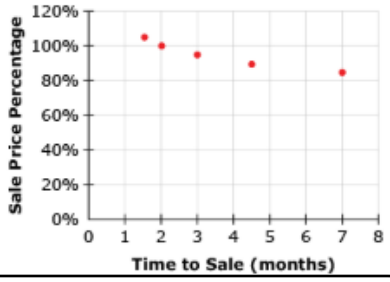
Question 2:

Rita is a real estate broker and wants to compare the time it takes to sell a house to the sale price (as a percentage of asking price). The table below shows the data for five of her recent clients.

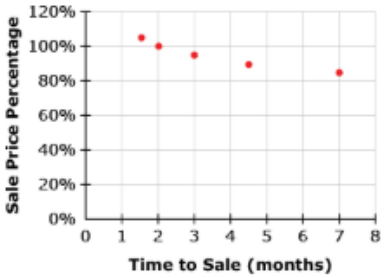
Client #	Time to Sale (months)	Sale Price Percentage
1	7	85%
2	1.5	105%
3	3	96%
4	4.5	90%
5	2	100%

Which scatter plot shows this relationship, and how might she describe the relationship between the time to sale and sales price percentage?

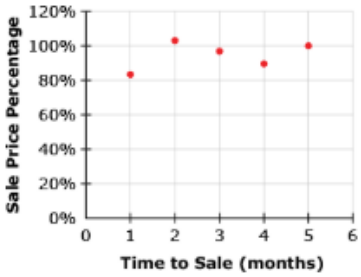
a. no association



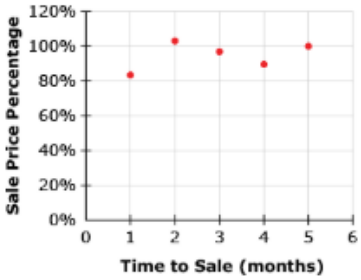
b. negative linear association



c. no association



d. positive linear association



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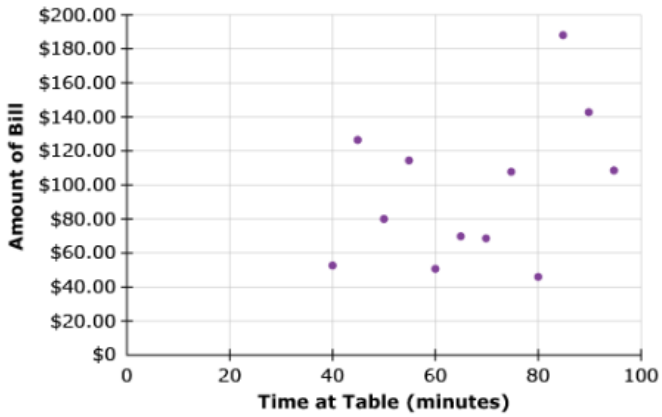
Question 3:

Fillipo manages a restaurant and wants to know whether the amount of time a group sits at a table is related to the amount of money they spend. He observes several tables over the course of an evening and makes the following graph:



Which of the following **best** describes the relationship between time at the table and amount spent?

a. positive linear association

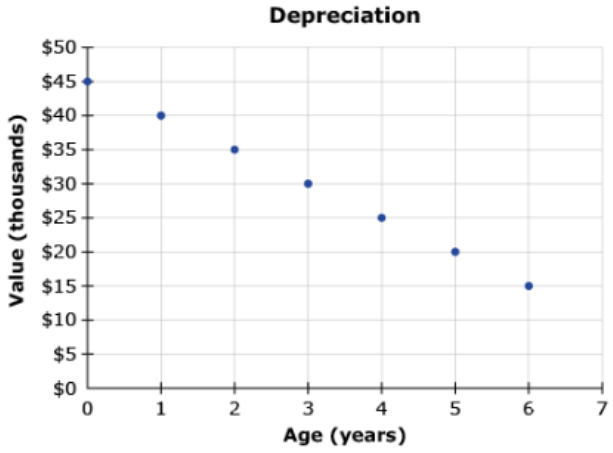
b. negative linear association

c. non-linear association

d. no association

Question 4:

Linn uses the scatter plot below to track the depreciation (loss of value over time) of a certain piece of medical equipment.



What equation describes the line of **best** fit for the data?

a. $y = 5x + 15$

b. $y = 5x - 45$

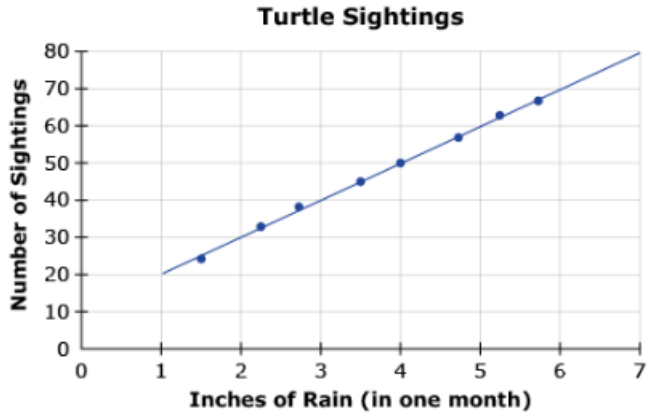
c. $y = -5x + 45$

d. $y = -5x - 15$

Continue

Question 5:

A biologist is studying turtles and wants to know how rainfall affects their movement patterns. She makes the following graph to show the relationship between rainfall and turtle sightings on a major road in town.



Based on the graph, how many turtle sightings would be expected during a month with 3-inches of rainfall?

40 turtle sightings

Continue

Question 6:

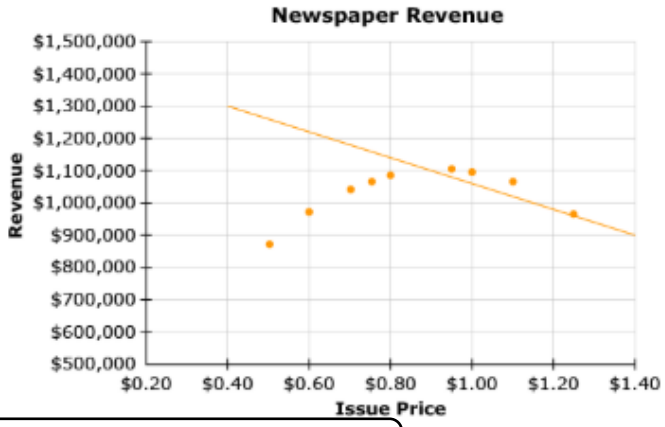
An accountant at a big city newspaper is looking at the relationship between the price of the newspaper and the amount of revenue generated, and decides to make a scatterplot.

Which of the following shows a line that befits the data?

a.

b.

c.



d. The data does not suggest a linear relationship.

Continue

Question 7:

A veterinarian collected data about the growth of a puppy during the first 9 weeks after birth. She wrote the equation below to show the relationship between the age of the puppy in weeks (w) and its weight in ounces (n).

$n = 3 + 1.6w$

Based on this equation, how much will the puppy weigh after 6 weeks?

12.6 ounces

Question 8:

A stock broker is using the capital asset pricing model (CAPM) to analyze the stock of ABC Company. Under current conditions, the model predicts that the equation shown below describes the relationship between the percent return on ABC Stock (r) and the percent return on the entire stock market (m).

$r = 1.6m - 1.8$

Based on this equation, which of the following statements is true?

a. If the market return increases by 1%, the return on ABC stock will decrease by 1.8%.

b. If the market return increases by 1%, the return on ABC stock will increase by 1.6%.

c. If the market return increases by 1.6%, the return on ABC stock will increase by 1%.

d. If the market return decreases by 1%, the return on ABC stock will decrease by 1.8%.

Question 9:

A veterinarian collected data about the growth of a puppy during the first 9 weeks after birth. She wrote the equation below to show the relationship between the age of the puppy in weeks (w) and its weight in ounces (n).

$n = 3 + 1.6w$

Based on this equation, how long will it take the puppy to grow to be 1 pound (16 ounces)?

a. between 3 and 4 weeks

b. between 4 and 5 weeks

c. between 8 and 9 weeks

d. more than 9 weeks

Continue

Question 10:

A veterinarian collected data about the growth of a puppy during the first 9 weeks after birth. She wrote the equation below to show the relationship between the age of the puppy weeks (w) and its weight in ounces (n).

$n = 3 + 1.6w$

As she sees other puppies come in for check-ups, she records their age and weight. If the age and weight do not match the equation closely enough (within 1 ounce), she will want to take a closer look at the puppy's diet.

Which of the following puppies will require a closer look? (Select all that apply.)

- [ ] Patient A: 3 weeks old, 10.8 ounces
- [ ] Patient B: 5 weeks old, 11.2 ounces
- [ ] Patient C: 7 weeks old, 14.0 ounces
- [ ] Patient D: 8 weeks old, 14.4 ounces
- [ ] Patient E: 6 weeks old, 19.6 ounces

Question 11:

A journalist is doing a story on a proposed water treatment project. He interviews residents of the town to see what kind of support the project has. He is curious whether home ownership has any link to support for the project. After surveying 40 people, he constructs the following two-way table.

	Support for Water Treatment Project		
Home Ownership		Yes	No
	Own	15	11
	Rent	6	8

Which statement is a reasonable conclusion based on the survey results?

a. Homeowners are no more likely to support the project than renters, because $\frac{21}{40}$ is not much larger than $\frac{19}{40}$.

b. Homeowners are more likely to support the project than renters, because $\frac{15}{26}$ is much greater than $\frac{6}{14}$.

c. Homeowners are more likely to support the project than renters, because $\frac{15}{26}$ is much greater than $\frac{11}{26}$.

d. Homeowners are more likely to support the project than renters, because $\frac{26}{40}$ is much greater than $\frac{14}{40}$.

Continue

Question 12:

A chef is curious whether patrons who make advanced reservations are less likely to order from the specials menu. He asks the hostess to keep track for one evening and she makes the following table.

	Reservations		
Orders from Specials Menu		Yes	No
	Yes	11	15
	No	24	30

What can the chef conclude based on the data and why?

a. People who make advanced reservations are more likely to order from the specials menu.

b. There is no link between making advanced reservations and ordering from the specials menu.

c. People who make advanced reservations are less likely to order from the specials menu.

d. There is insufficient data to make a conclusion.

Question 13:

An airline logistics manager is trying to determine what kinds of passengers check an extra bag when flying. Using data from several flights he constructs the table below to investigate whether the seating choice (coach or first class) has any link to whether the passenger checks an extra bag.

	Extra bag checked?		
Seating Section		Yes	No
	Coach	42%	36%
	First Class	14%	8%

Which of the following statements are supported by the data? (Select all that apply.)

- [ ] $\frac{3}{4}$ of passengers who fly coach check an extra bag.
- [ ] Over 80% of passengers who do not check a bag are flying coach.
- [ ] Passengers who fly coach are more likely to check an extra bag than passengers flying first class.
- [ ] Passengers who fly coach are less likely to check an extra bag than passengers flying first class.

Continue

Question 14:

A dental hygienist asks 60 of her patients about their dental habits. She constructs the following table based on their responses.

	Floss daily?		
Brush 3 times a day?		Yes	No
	Yes	24	4
	No	11	21

Calculate the relative frequencies (to the nearest percent) and write your answers in the report below.

Percentage of patients who floss daily:	58 %
Percentage of patients who brush 3 times a day:	47 %
Of patients who floss daily, percentage who do not brush 3 times a day:	31 %
Of patients who brush 3 times a day, percentage who also floss daily	86 %

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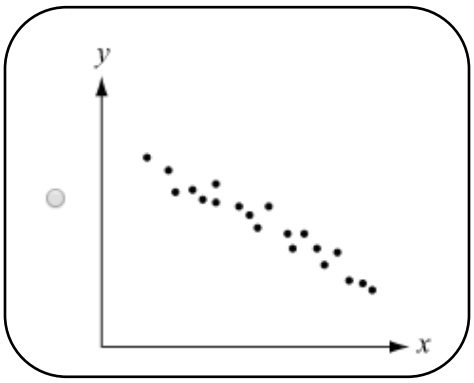
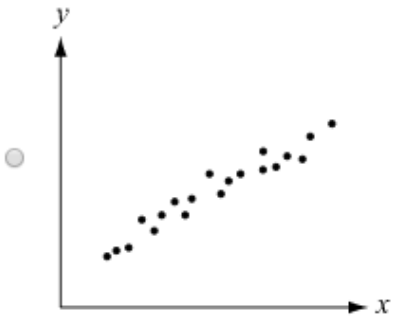
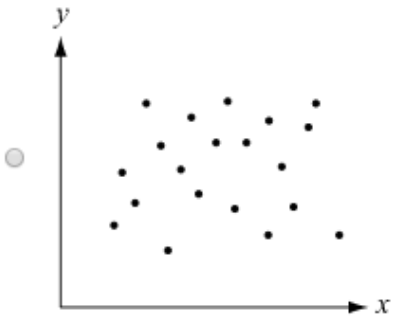
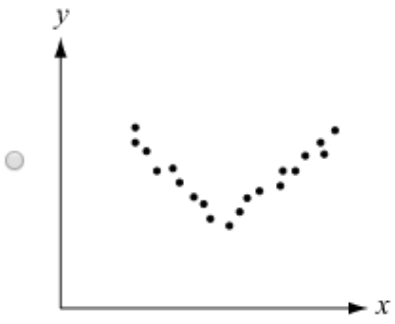
Question 15:

Which scatter plot shows a negative linear relationship between variables x and y?









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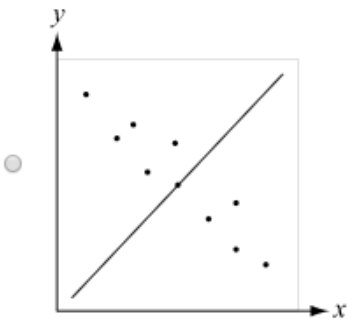
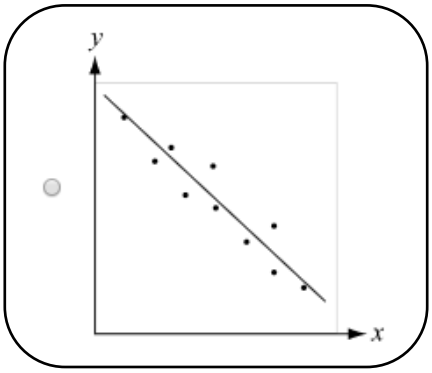
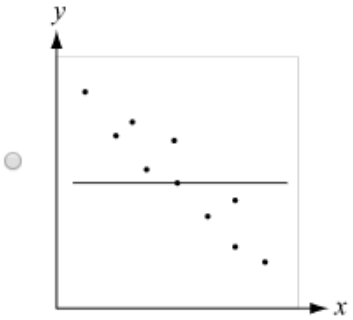
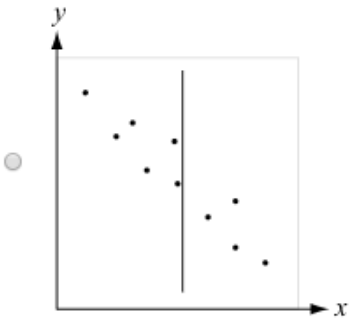
Question 16:

In which graph does the line best model the data?









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Question 17:

Albert works in a store that sells T-shirts. He made this graph to show the relationship between the number of customers that come into the store each day and the number of T-shirts the store sells that day.

Based on the graph, about how many T-shirts would be sold on a day when 100 customers come into the store?

- 150
- 175
- 200
- 225

Question 18:

A veterinarian collected data about the growth of a puppy during the first 9 weeks after birth. She wrote the equation below to show the relationship between the age of the puppy in weeks (w) and its weight in ounces (n).

$n = 3 + 1.6w$

Complete the statement to give the **best** interpretation of the data.

The weight of the puppy was [a. 1.6 / b. 3] ounces at birth and [a. Increased / b. Decrease] about [a. 1.6 / b. 3] ounces per week

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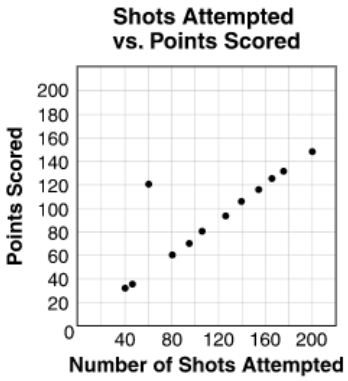
Question 19:

There are 12 girls on Hannah's basketball team. The scatter plot below shows the number of shots attempted and the number of points scored for each girl last season.



The outlier on the scatter plot represents one player's results. How many points did that player score last season?

120 points

Question 20:

A survey consisted of asking 40 students the following two questions:

- Do you take music lessons?
- Do you play afterschool sports?

The table below shows students' responses to the survey questions.

	Afterschool Sports?		
Music Lessons?		Yes	No
	Yes	?	5
	No	8	12

How many students who participated in the survey take music lessons and play afterschool sports?

15 students

Stop