Scatter plot, Correlation, and Line of Best Fit Exam

High School Common Core: Interpret Linear Models

Name:_____

Pd:_____   Date:_____

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1. A baseball coach graphs some data and finds the line of best fit. The equation for the line of best fit is
y = 0.32x – 20.51, where x is the number of times at bat and y is the number of hits.

How many hits should he expect from a player who is at bat 175 times?

A) 35 hits
B) 49 hits
C) 609 hits
D) 62 hits

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3. Chang wants to know if he is improving his skill on the cello. He created a scatter plot and drew a line of best fit.
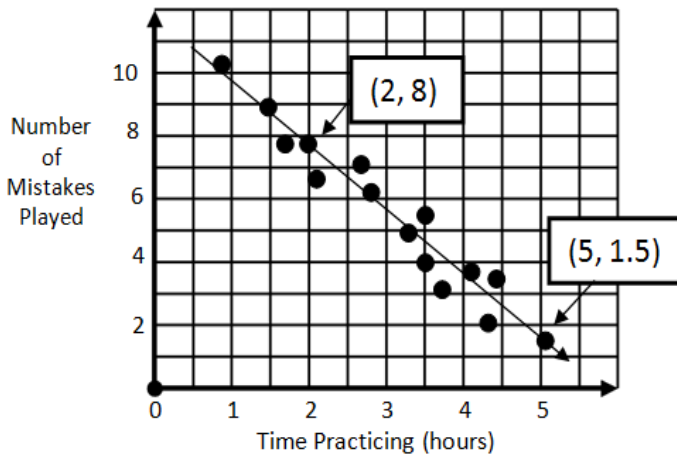
If he uses the point (2, 8) and (5, 1.5) from his line, which equation would best represent the line of best fit?

A) y = -2.17x + 12.3
B) y = 2.17x + 3.77
C) y = -0.46x + 9
D) y = -2.17x – 9.35

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5. Jared collected data on the ages and heights of a random sample of elementary school students. If he plots the data on a scatter plot, what relationship will he most likely see between age and height?

A) A negative correlation
B) No correlation
C) A positive correlation
D) A constant correlation

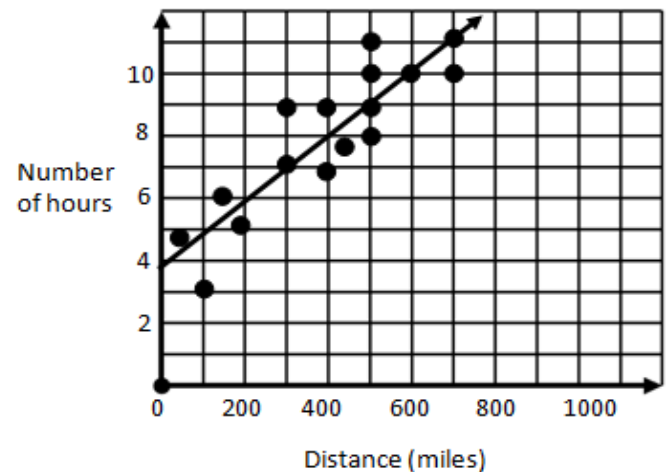2. Below is the table of data regarding the cherry blossom trees in Washington D.C. A) Make a scatter plot of the given data.

Average Temp (°C)	1.5	5.8	2.4	4.0	4.7	5.4	3.2	5.0
Date in April trees bloom	28	3	25	21	14	8	20	6
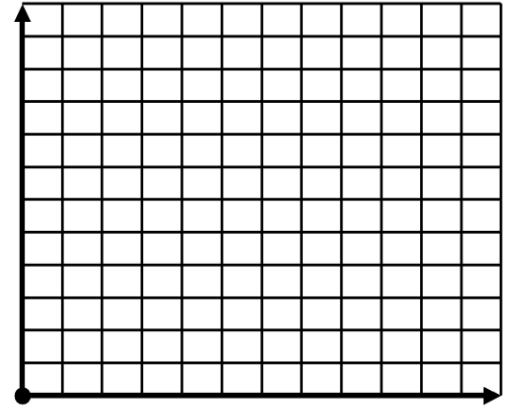
B) Correlation:_____

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4. The graph below shows the relationship between the distance in miles a delivery truck traveled and the number of hours each delivery took.
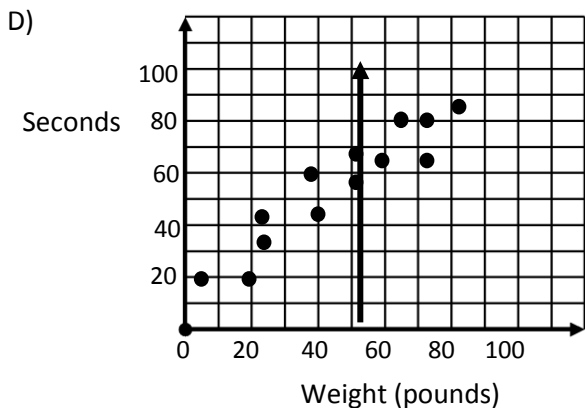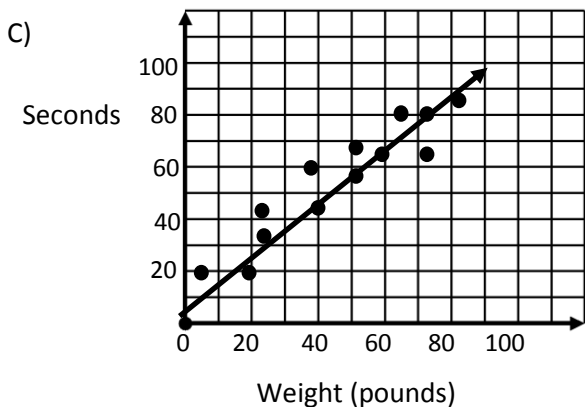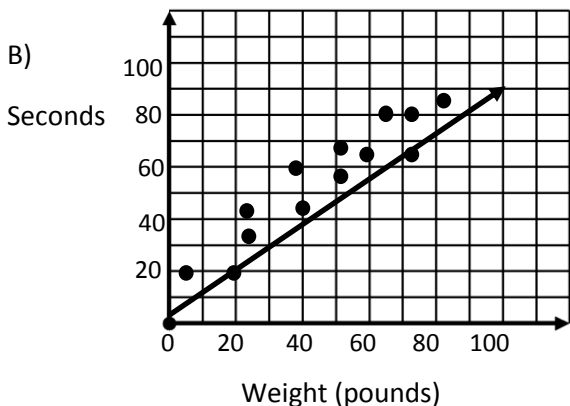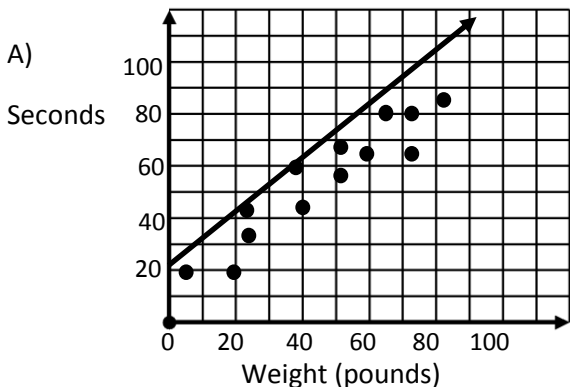

Which of the two given points would be the best to use to calculate the line of best fit?

A) (500, 11) and (700, 11)
B) (300, 9) and (400, 7)
C) (400, 9) and (500, 11)
D) (300, 7) and (600, 10)

6. The graph shows the weights of dogs and the time it took the same dogs to complete an agility course in seconds.

Which shows the line of best fit for the data?

A)

Seconds vs Weight (pounds)

B)

Seconds vs Weight (pounds)

C)

Seconds vs Weight (pounds)

D)

Seconds vs Weight (pounds)

7. A high school principal wants to predict the number of students who will drop out of school so he can get funding for support services.
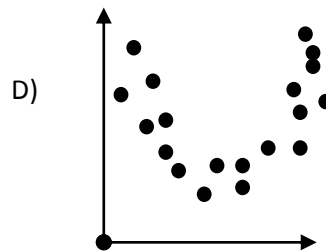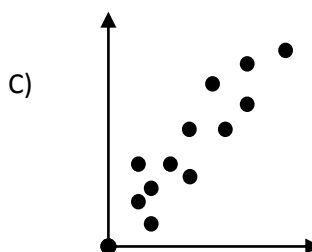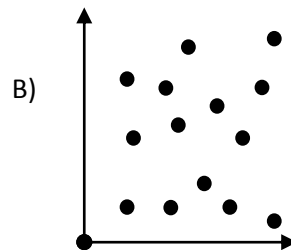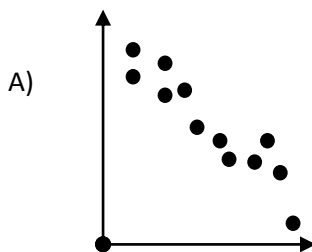
Year	The number of students who drop out of high school
2004	217
2005	202
2006	199
2007	185
2008	180
2009	163

He determined the equation that represents this data as **y = -10x + 216**, where x represents the years since 2004, and y is the number of students who drop out.

Use this equation to help him predict the number of students who will drop out in 2012?

A) -20, 2996 students
B) 21 students
C) 136 students
D) 156 students

8. Which graph represents a positive correlation?

A)

B)

C)

D)

9. The scatter plot below shows the average yearly consumption of bottled water by people in the United States starting in 1990.

Gallons of Bottled Water per Person vs Year

Using the line of best fit, predict the average consumption of bottled water in the year 2000?

A) 20 gallons   B) 18 gallons   C) 20 gallons   D) 19 gallons

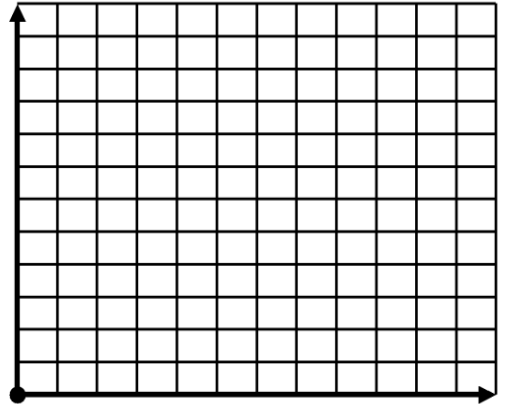10. The table below shows the sales for a flower company for the years 2007 through 2012. Answer the given questions about this table on your answer sheet.

A) Graph the data on the scatter plot and draw a line of best fit for the data.

FLOWER   SALES

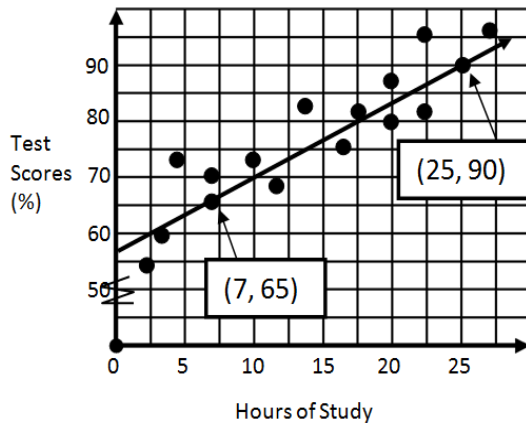| Year	Sales (in thousands)
2007	$305
2008	$330
2009	$345
2010	$370
2011	$395
2012	$420

B) Write an equation for the line of best fit for this data. Let x represent the years since 2007 and y represent the sales, in thousands of dollars.

C) According to your equation, in what year will the sales reach about $500 (in thousands)? Use mathematics to explain how you determined your answer.

11. Mr. Van made a graph to represent the time his students spent studying for their test and their actual test score.
Which is the correct equation for the line of best fit?

A) y = 1.4x + 55
B) y = 1.4x − 84
C) y = 0.72x + 60
D) y = 0.72 + 56

Test Scores (%)

(25, 90)

(7, 65)

Hours of Study

12. Which relationship is shown by this scatter plot?

Number of new gym memberships sold

Cost of a gym membership

A) As the cost goes down, the number sold goes down.
B) As the cost goes up, the number sold goes down.
C) As the cost does down, the number sold remains the same.
D) There is no relationship between cost and the number sold.

13. Which scatter plot best represents the data given in the table?
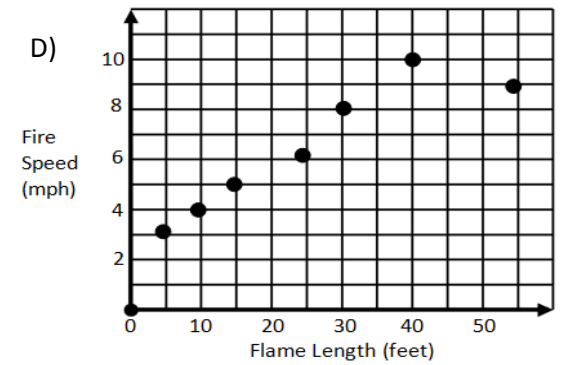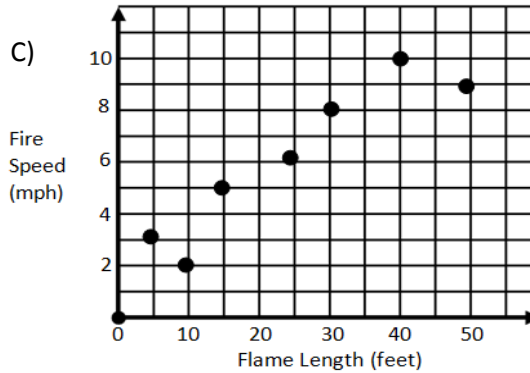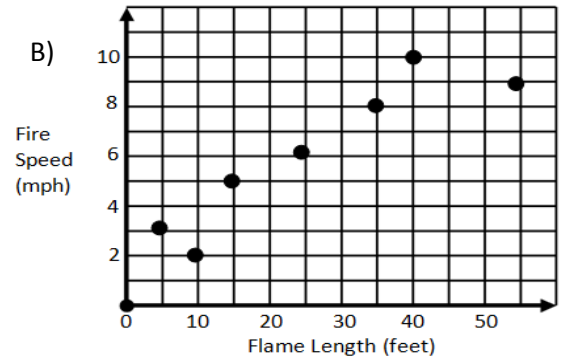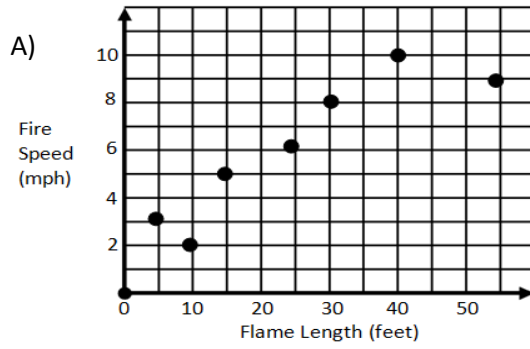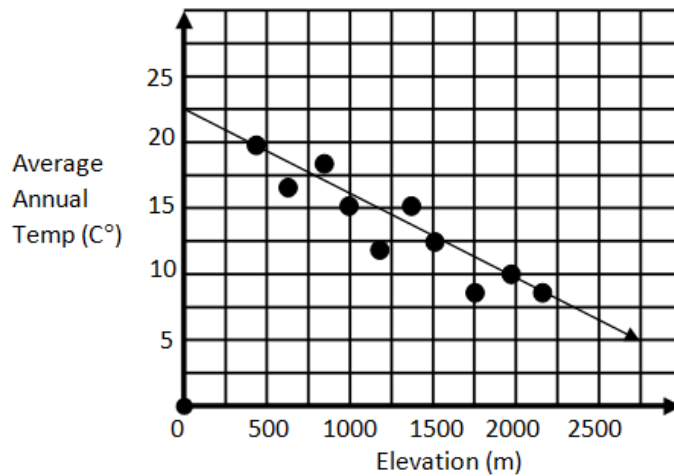
Flame Length	Fire Speed (mph)
10	2
40	10
15	5
5	3
55	9
30	8
25	6

A)

Fire Speed (mph) vs Flame Length (feet)

B)

Fire Speed (mph) vs Flame Length (feet)

C)

Fire Speed (mph) vs Flame Length (feet)

D)

Fire Speed (mph) vs Flame Length (feet)

14. Given in the table and scatter plot are the samplings of average annual temperatures collected at different elevations in the United States. Pick two points from the line of best fit and determine the equation for the line of best fit.

Elevation (meters)	Average Annual Temp (°C)
1,000	15
490	20
2,200	8
650	17
1,750	8
1,500	12.5
800	18
1,400	15
2,000	10
1,200	12

Average Annual Temp (C°) vs Elevation (m)

15. Which graph represents the correlation of its given situation correctly?

A)

Amount of dog food purchased vs Size of the dog

B)

Number of tourists flying to Hawaii vs Cost of plane ticket

C)

Number of people going swimming vs Temperature

D)

Amount of clothing sold vs Number of customers at clothing store

16. The following data table and scatter plot represent the number of negative customer reviews for a given model of cell phone and the total number of that same cell phone model that were sold. Answer the following TRUE or FALSE questions.

Number of consumer negative reviews	Number of cell phones sold (in thousands)
125	163
98	505
50	701
106	355
21	925
69	592
80	700
37	890

Number of cell phones sold (in thousands)

Number of negative consumer reviews

A) Points (37, 890) and (98, 505) are on the line of best fit:_____

B) This scatter plot represents a negative correlation:_____

C) It's reasonable to predict that if there are 75 negative reviews the number of cell phones sold of that same model will be close to 600,000._____

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17. Below is the number of clothes donated to New York City homeless shelters in the given years.

Number of clothes donated (in thousands)

(1996, 47)

(2012, 41)

1992 1996 2000 2004 2008 2012
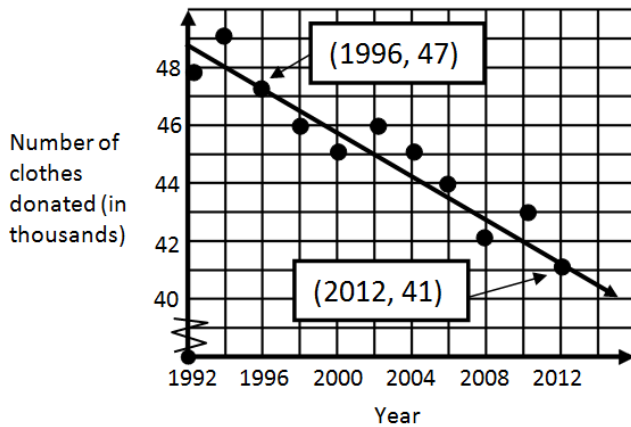
Year

A) Determine the equation for the line of best fit using the given two points on the line of best fit, where x is the number years since 1992 and y is the number of clothes donated in thousands.
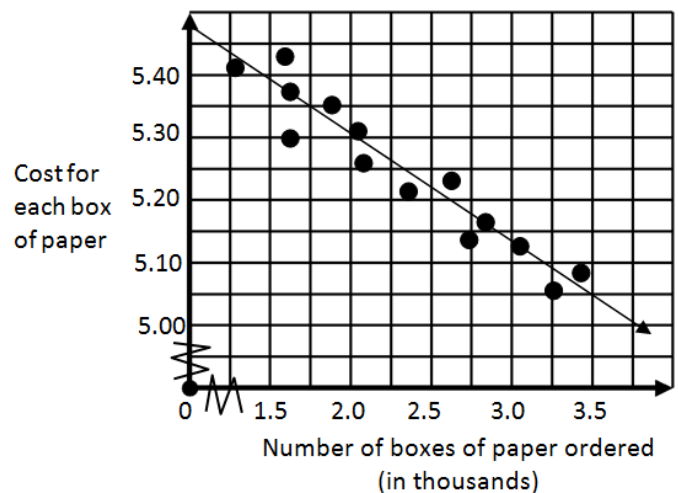
B) Using the equation for the line of best fit predict the year in which only 38,000 items of clothing will be donated to the homeless shelters in New York City.

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18. A keyboarding instructor at a community college collected data comparing a student's age and their typing speed. The equation for the line of best fit is given as **y = -1.4x + 117.8**, where x is the "age in years" and y is the "typing speed.

If you are 25 years of age, what is your typing speed?

A) 153 words per minute
B) 83 words per minute
C) 63 words per minute
D) 102 words per minute.

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19 At the Happy Paper company the more boxes of paper you order the cheaper the price you have to pay for each box of paper. Below are the prices charged per box of paper to different companies ordering various quantities of paper.
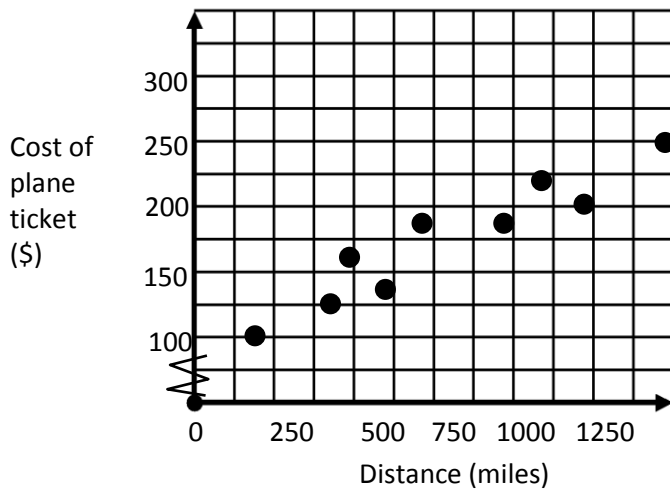
Cost for each box of paper

Number of boxes of paper ordered (in thousands)

Using the line of best fit, if your company wants to only pay $5.05 for each box of paper, how many boxes of paper should be ordered from Happy Paper company?

20. The table below shows the cost of flying from San Francisco to various other cities in the United States. There is a relationship between the distance you are flying and the cost of your plan ticket. The data from the table is represented on the scatter plot.

Distance(miles)	600	374	1,240	725	150	1,100	950	1,500	500
Cost of the plane ticket ($)	143	125	200	180	110	224	180	250	164

A) Draw a line of best fit and pick two good points from the table that are on your line:

Cost of plane ticket ($)

Distance (miles)

B) Determine the equation for the line of best fit.

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21. The table below shows how much water Nuria drinks and the average temperature for that day. A) Make for the given data table.

Temp (F°)	Water consumed in a day (oz)
99	48
85	27
97	48
80	16
92	32
88	34
94	40
83	20

B) What is the correlation? _____
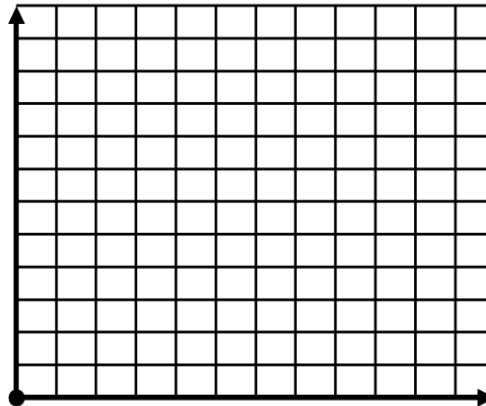
22. Determine the correlation for each statement.

A)   The number of people at your party and the number of sodas you have in the refrigerator.

B) The amount your drive to school and the amount you have to pay for gas.

C) The size your dog and the number of times you take it to the vet.

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23. The table below represents the number of powerboats registered in the given year.

Year	Powerboat Registrations (thousands)
1996	751
1997	797
1998	806
1999	805
2000	841
2001	903
2002	923

The equation for the line of best for this data is given as y = 27x + 751, where x is the years since 1996, and y is the total powerboat registrations.

Using the given equation for the line of best fit, which is a good prediction for number of powerboat registrations in 2015?

Mrs Math

Scatter plot, Correlation, and Line of Best Fit Exam

High School Common Core: Interpret Linear Models

ANSWER KEY

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1. A baseball coach graphs some data and finds the line of best fit. The equation for the line of best fit is $y = 0.32x - 20.51$, where x is the number of times at bat and y is the number of hits.

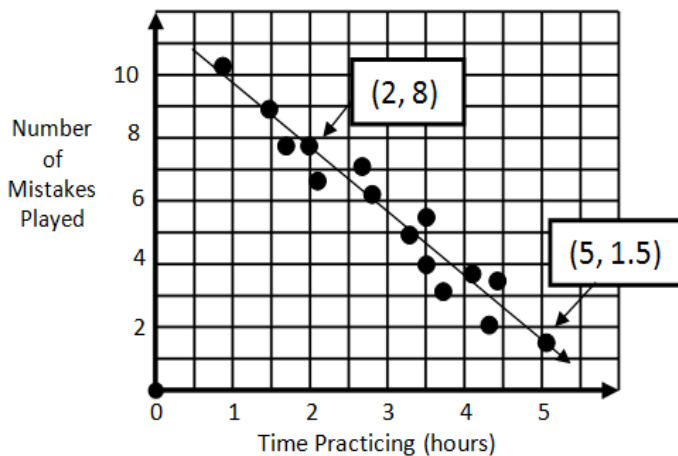How many hits should he expect from a player who is at bat 175 times?

A) 35 hits (circled)
B) 49 hits
C) 609 hits
D) 62 hits

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3. Chang wants to know if he is improving his skills on the cello. He created a scatter plot and drew a line of best fit.

(2, 8)

(5, 1.5)

If he uses the point (2, 8) and (5, 1.5) from his line, which equation would best represent the line of best fit?

A) y = -2.17x + 12.3 (circled)
B) y = 2.17x + 3.77
C) y = -0.46x + 9
D) y = -2.17x – 9.35

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5. Jared collected data on the ages and heights of a random sample of elementary school students. If he plots the data on a scatter plot, what relationship will he most likely see between age and height?
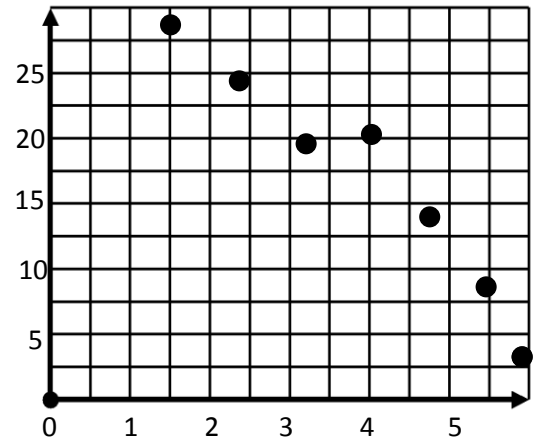
A) A negative correlation
B) No correlation
C) A positive correlation (circled)
D) A constant correlation

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2. Below is the table of data regarding the cherry blossom trees in Washington D.C. A) Make a scatter plot of the given data.

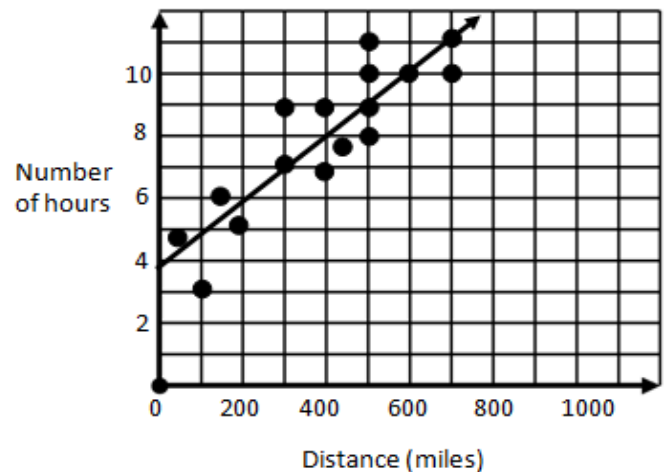| Average Temp (°C)	1.5	5.8	2.4	4.0	4.7	5.4	3.2	5.0
Date in April trees bloom	28	3	25	21	14	8	20	6

Date in April trees blooms

Average Temp (C°)

B) Correlation: **Negative**

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4. The graph below shows the relationship between the distance in miles a delivery truck traveled and the number of hours each delivery took.

Which of the two given points would be the best to use to calculate the line of best fit?
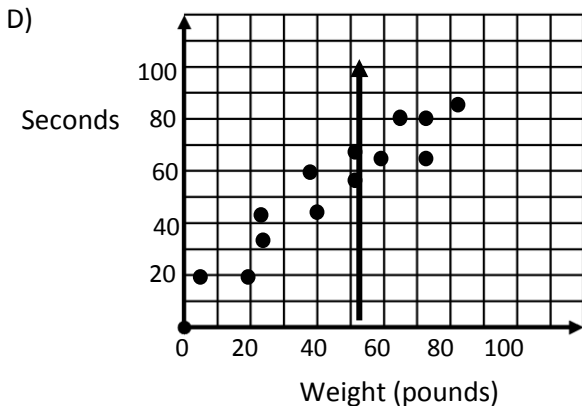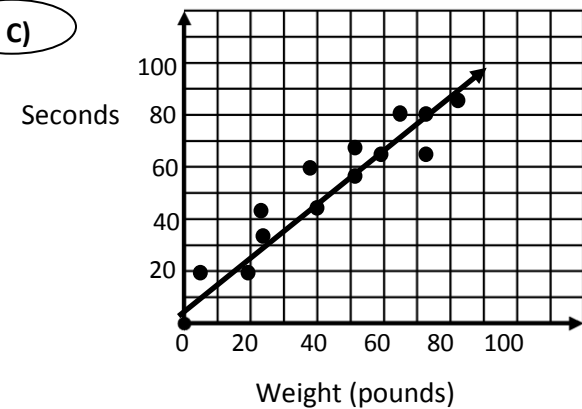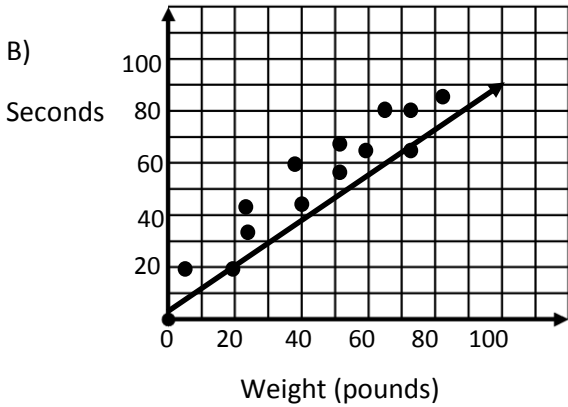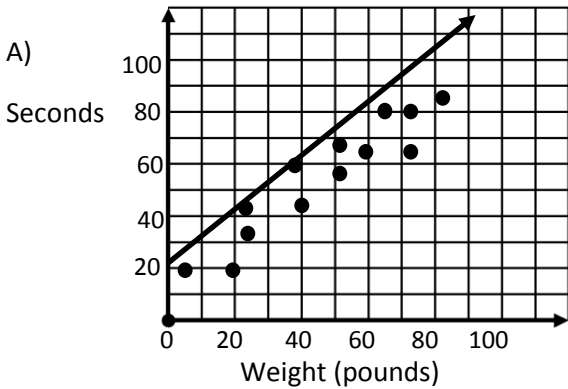
A) (500, 11) and (700, 11)
B) (300, 9) and (400, 7)
C) (400, 9) and (500, 11)
D) (300, 7) and (600, 10) (circled)

6. The graph shows the weights of dogs and the time it took the same dogs to complete an agility course in seconds.

Which shows the line of best fit for the data?

A)

Seconds vs Weight (pounds)

B)

Seconds vs Weight (pounds)

C)

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D)

Seconds vs Weight (pounds)

7. A high school principal wants to predict the number of students who will drop out of school so he can get funding for support services.

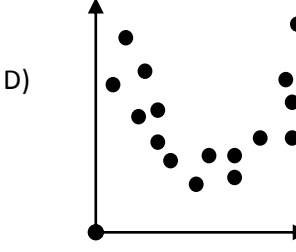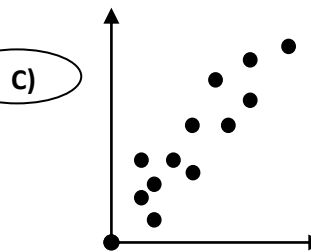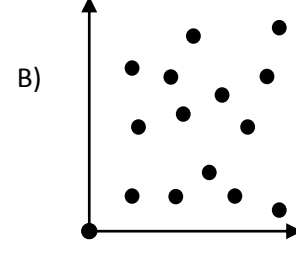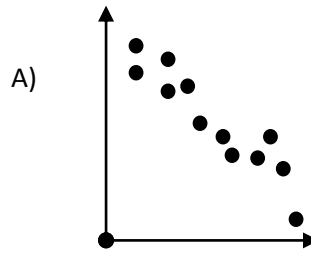| Year	The number of students who drop out of high school
2004	217
2005	202
2006	199
2007	185
2008	180
2009	163

He determined the equation that represents this data as $y = -10x + 216$, where x represents the years since 2004, and y is the number of students who drop out.

Use this equation to help him predict the number of students who will drop out in 2012?

A) -20, 2996 students
B) 21 students
C) **136 students**
D) 156 students

8. Which graph represents a positive correlation?

A)

B)

C)

D)

9. The scatter plot below shows the average yearly consumption of bottled water by people in the United States starting in 1990.

Gallons of Bottled Water per Person vs Year

Using the line of best fit, predict the average consumption of bottled water in the year 2000?

A) 20 gallons   B) 18 gallons   C) 22 gallons   **D) 19 gallons**

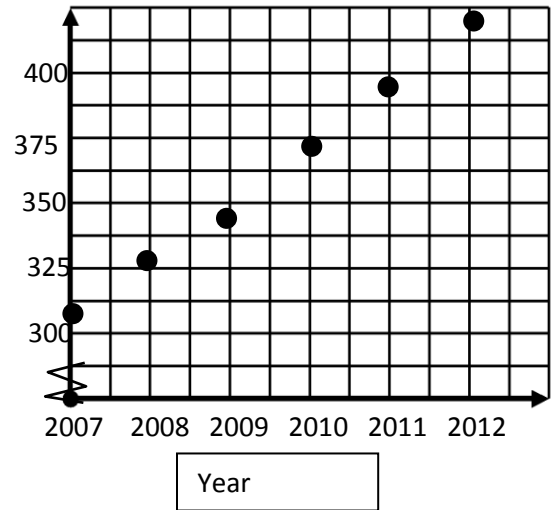10. The table below shows the sales for a flower company for the years 2007 through 2012. Answer the given questions about this table on your answer sheet.

A) Graph the data on the scatter plot and draw a line of best fit for the data.

FLOWER SALES

Year	Sales (in thousands)
2007	$305
2008	$330
2009	$345
2010	$370
2011	$395
2012	$420

Sales (in thousands)

Year

B) Write an equation for the line of best fit for this data. Let x represent the years since 2007 and y represent the sales, in thousands of dollars.

An equation similar to   **y = 22.7x + 304**

C) According to your equation, in what year will the sales reach about $500 (in thousands)? Use mathematics to explain how you determined your answer.

8 or 9 years from 2007 or **2015 or 2016**

11. Mr. Van made a graph to represent the time his students spent studying for their test and their actual test score.
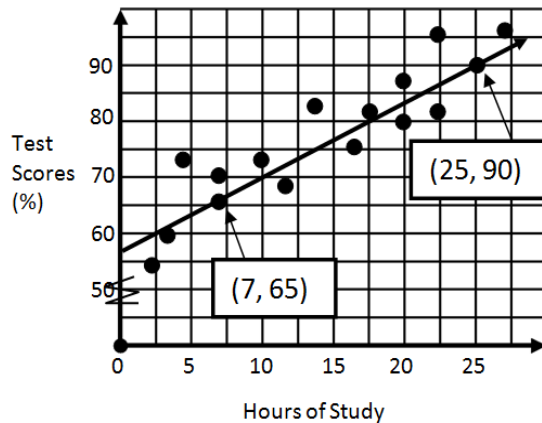Which is the correct equation for the line of best fit?

A) y = 1.4x + 55
B) y = 1.4x − 84
C) y = 0.72x + 60
D) y = 0.72 + 56

Test Scores (%)

(25, 90)

(7, 65)

Hours of Study

12. Which relationship is shown by this scatter plot?

Number of new gym memberships sold

Cost of a gym membership
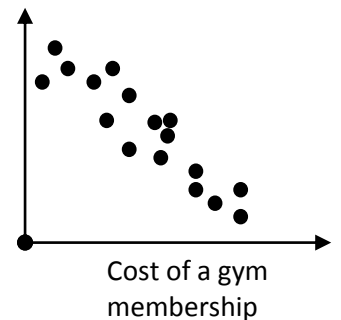
A) As the cost goes down, the number sold goes down.
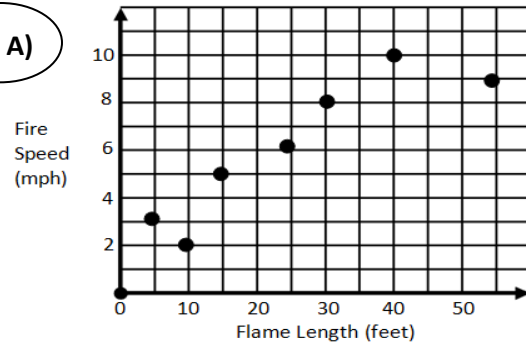B) As the cost goes up, the number sold goes down.
C) As the cost does down, the number sold remains the same.
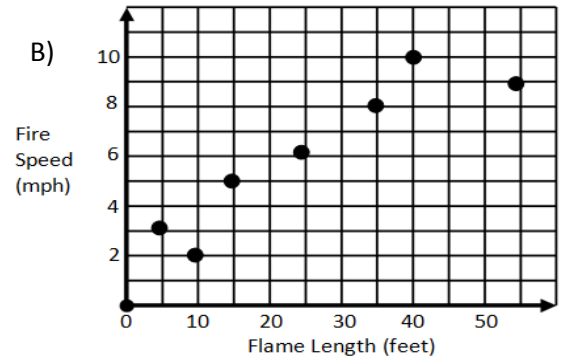D) There is no relationship between cost and the number sold.

13. Which scatter plot best represents the data given in the table?

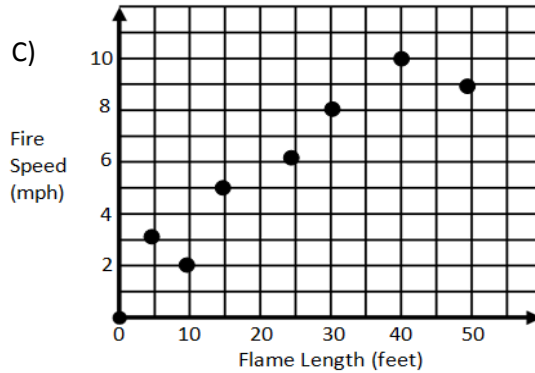| Flame Length	Fire Speed (mph)
10	2
40	10
15	5
5	3
55	9
30	8
25	6

A)

B)

C)

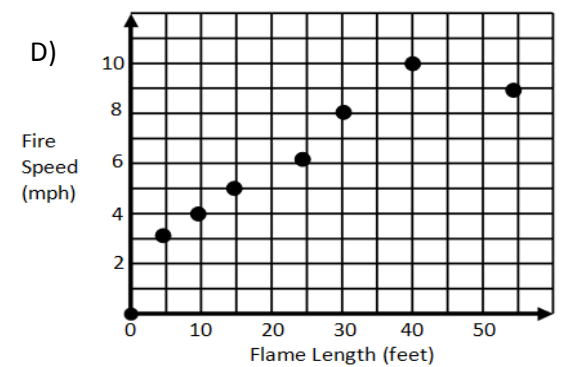**D)**

14. Given in the table and scatter plot are the samplings of average annual temperatures collected at different elevations in the United States. Pick two points from the line of best fit and determine the equation for the line of best fit.

Elevation (meters)	Average Annual Temp (°C)
1,000	15
490	20
2,200	8
650	17
1,750	8
1,500	12.5
800	18
1,400	15
2,000	10
1,200	12

Something close to the equation

y = -0.0062x + 23.34

15. Which graph represents the correlation of its given situation correctly?

A)

Amount of dog food purchased / Size of the dog

B)

Number of tourists flying to Hawaii / Cost of plane ticket

C)

Number of people going swimming / Temperature

D)

Amount of clothing sold / Number of customers at clothing store

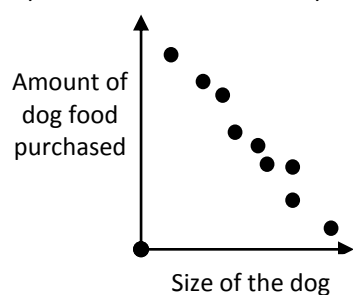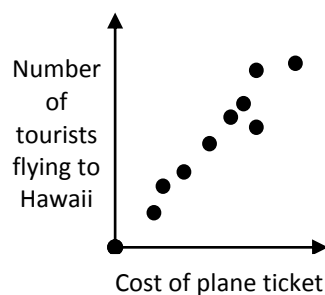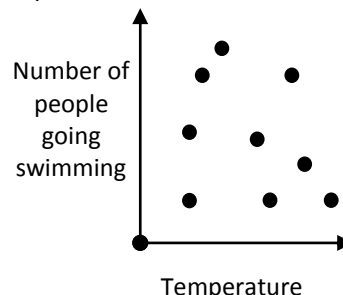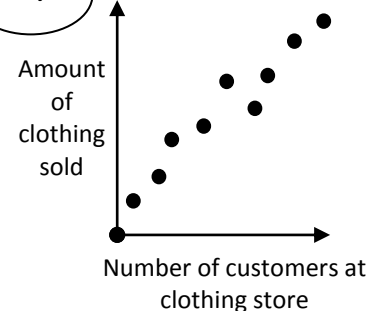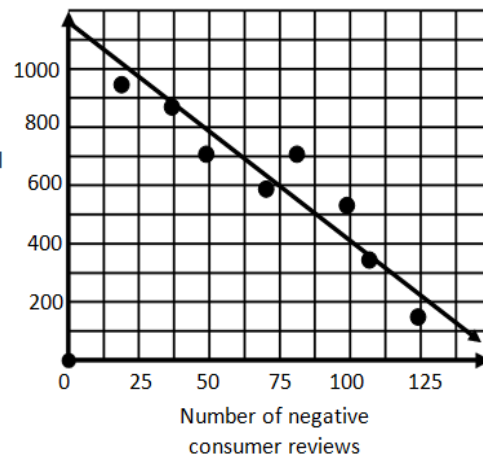**16.** The following data table and scatter plot represent the number of negative customer reviews for a given model of cell phone and the total number of that same cell phone model that were sold. Answer the following TRUE or FALSE questions.

Number of consumer negative reviews	Number of cell phones sold (in thousands)
125	163
98	505
50	701
106	355
21	925
69	592
80	700
37	890

Number of cell phones sold (in thousands)

1000
800
600
400
200

0   25   50   75   100   125

Number of negative consumer reviews

A) Points (37, 890) and (98, 505) are on the line of best fit: **FALSE**

B) This scatter plot represents a negative correlation: **TRUE**

C) It's reasonable to predict that if there are 75 negative reviews the number of cell phones sold of that same model will be close to 600,000. **TRUE**

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17. Below is the number of clothes donated to New York City homeless shelters in the given years.

Number of clothes donated (in thousands)

48
(1996, 47)
46
44
42
40   (2012, 41)

1992 1996 2000 2004 2008 2012
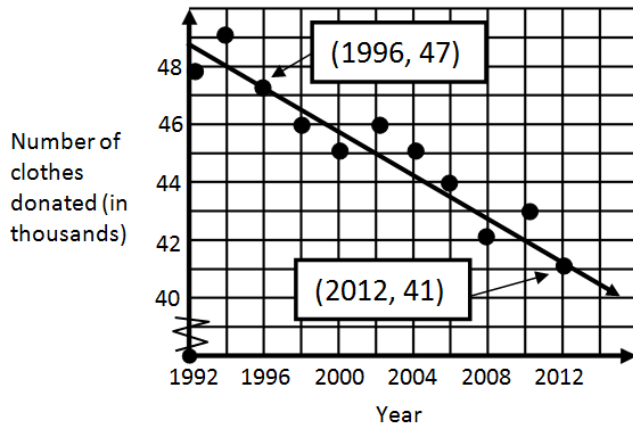
Year

A) Determine the equation for the line of best fit using the given two points on the line of best fit, where x is the number years since 1992 and y is the number of clothes donated in thousands.

y = -0.375x + 48.5

B) Using the equation for the line of best fit predict the year in which only 38,000 items of clothing will be donated to the homeless shelters in New York City.
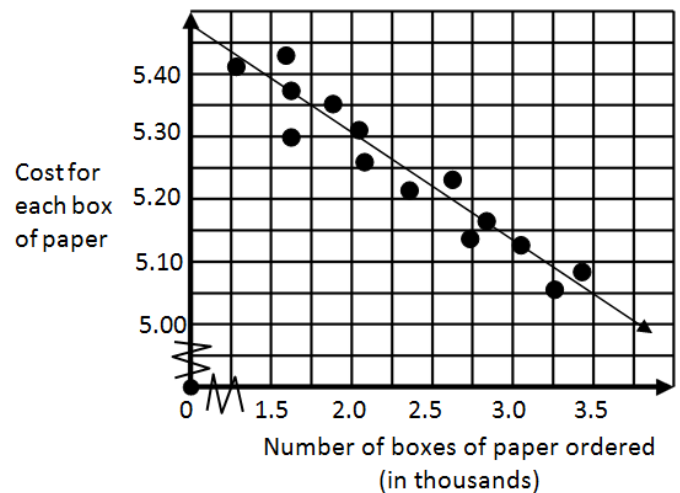
About 28 years from 1992 or **2020**

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18. A keyboarding instructor at a community college collected data comparing a student's age and their typing speed. The equation for the line of best fit is given as y = -1.4x + 117.8, where x is the "age in years" and y is the "typing speed.

If you are 25 years of age, what is your typing speed?

A) 153 words per minute
B) **83 words per minute**
C) 63 words per minute
D) 102 words per minute.

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19. At the Happy Paper company the more boxes of paper you order the cheaper the price you have to pay for each box of paper. Below are the prices charged per box of paper to different companies ordering various quantities of paper.

Cost for each box of paper

5.40
5.30
5.20
5.10
5.00

0   1.5   2.0   2.5   3.0   3.5
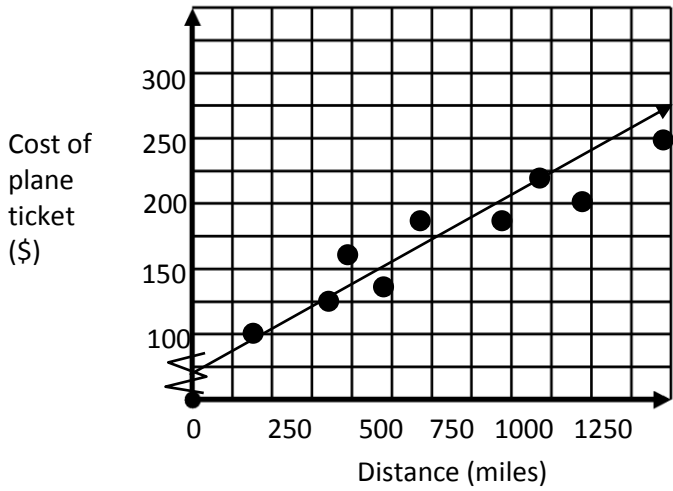
Number of boxes of paper ordered (in thousands)

Using the line of best fit, if your company wants to only pay $5.05 for each box of paper, how many boxes of paper should be ordered from Happy Paper company?
3.5 thousand or 3,500 boxes

20. The table below shows the cost of flying from San Francisco to various other cities in the United States. There is a relationship between the distance you are flying and the cost of your plan ticket. The data from the table is represented on the scatter plot.

Distance(miles)	600	374	1,240	725	150	1,100	950	1,500	500
Cost of the plane ticket ($)	143	125	200	180	110	224	180	250	164

A) Draw a line of best fit and pick two good points from the table that are on your line: **(374, 125) & (1100, 224)**

B) Determine the equation for the line of best fit.

Equation such as **y =0.136x + 74**

Cost of plane ticket ($)

300
250
200
150
100

0   250   500   750 1000 1250

Distance (miles)

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21. The table below shows how much water Nuria drinks and the average temperature for that day. A) Make for the given data table.

Temp (F°)	Water consumed in a day (oz)
99	48
85	27
97	48
80	16
92	32
88	34
94	40
83	20

Water consumed (oz)

50
40
30
20
10

0   80   85   90   95   100

Temp (°F)
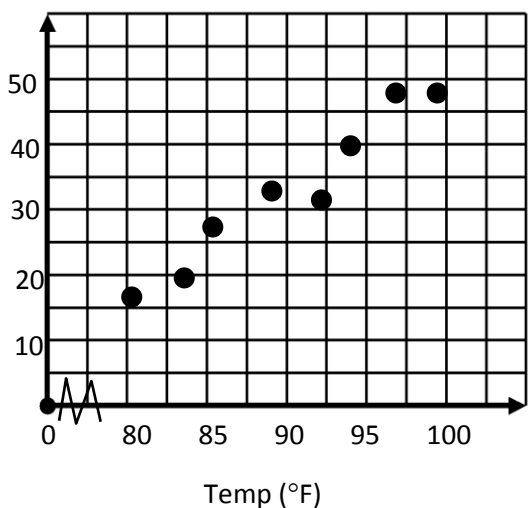
B) What is the correlation? **POSITIVE**

22. Determine the correlation for each statement.

A) The number of people at your party and the number of sodas you have in the refrigerator. **Negative**

B) The amount your drive to school and the amount you have to pay for gas. **Positive**

C) The size your dog and the number of times you take it to the vet. **None**

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23. The table below represents the number of powerboats registered in the given year.

Year	Powerboat Registrations (thousands)
1996	751
1997	797
1998	806
1999	805
2000	841
2001	903
2002	923

The equation for the line of best for this data is given as **y = 27x + 751**, where x is the years since 1996, and y is the total powerboat registrations.

Using the given equation for the line of best fit, which is a good prediction for number of powerboat registrations in 2015?

1,264 powerboat registrations