Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Pd:\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_

**Mr. Paulk**

Scatter plot, Correlation, and Line of Best Fit

High School Common Core: Interpret Linear Models

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.

B) Correlation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |



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



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)



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

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.

A) -20, 2996 students

B) 21 students

C) 136 students

D) 156 students

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?

 100

 80

 60

 40

 20

0 20 40 60 80 100

Weight (pounds)

Seconds



 100

 80

 60

 40

 20

0 20 40 60 80 100

Weight (pounds)

Seconds



 100

 80

 60

 40

 20

0 20 40 60 80 100

Weight (pounds)

Seconds



 100

 80

 60

 40

 20

0 20 40 60 80 100

Weight (pounds)

Seconds



A)

B)

C)

D)

|  |  |
| --- | --- |
| 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?

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.

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.

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.



 FLOWER SALES

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

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

Number of new gym memberships sold

Cost of a gym membership

12. Which relationship is shown by this scatter plot?

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?

1. B)

 C) D)







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



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 |

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

A) B) C) D)

Amount of clothing sold

Number of customers at clothing store

Number of tourists flying to Hawaii

Cost of plane ticket

Number of people going swimming

Temperature

Size of the dog

Amount of dog food purchased

|  |  |
| --- | --- |
| 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 |

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.

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.\_\_\_\_\_



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

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.

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.



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.

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?



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

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

B) What is the correlation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



 300

 250

200

 150

 100

0 250 500 750 1000 1250

Cost of plane ticket ($)

Distance (miles)

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

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.



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

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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:

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.

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

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?

ANSWER KEY

**Mrs Math**

Scatter plot, Correlation, and Line of Best Fit Exam

High School Common Core: Interpret Linear Models

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.

B) Correlation: **Negative**

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |



 25

15

 10

 5

 20

Date in April trees blooms

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.

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

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B) y = 2.17x + 3.77

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0 1 2 3 4 5

Average Temp (C°)

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)**



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

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.

A) -20, 2996 students

B) 21 students

**C) 136 students**

D) 156 students

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?

 100

 80

 60

 40

 20

0 20 40 60 80 100

Weight (pounds)

Seconds



 100

 80

 60

 40

 20

0 20 40 60 80 100

Weight (pounds)

Seconds



 100

 80

 60

 40

 20

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Weight (pounds)

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Seconds



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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.

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.

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



 FLOWER SALES

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

 400

Sales (in thousands)

 375

350

 325

 300

2007 2008 2009 2010 2011 2012

Year

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**

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Number of new gym memberships sold

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13. Which scatter plot best represents

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**A)** B)

 C) D)







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



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.

 Something close to the equation

 **y = -0.0062x + 23.34**



|  |  |
| --- | --- |
| 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 |

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

A) B) C) **D)**

Amount of clothing sold

Number of customers at clothing store

Number of tourists flying to Hawaii

Cost of plane ticket

Number of people going swimming

Temperature

Size of the dog

Amount of dog food purchased

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 |

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**

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?

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**B) 83 words per minute**

C) 63 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.

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**

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

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**

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**



 150

 250

 100

 300

200

Cost of plane ticket ($)

0 250 500 750 1000 1250

|  |  |
| --- | --- |
| 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**

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**

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

B) What is the correlation?  **POSITIVE**

Distance (miles)

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

Water consumed (oz)

 50

 40

 30

 20

 10

0 80 85 90 95 100

Temp (°F)



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