Time Frame: 50 minutes

Subject Matter: Line of Best Fit TELL ME

Objective: TSWBAT carry out the procedure using the TI 83 calculator to find a line of best fit for a scatter plot

Standards: DA – 3.8

Materials: TI 83 Calculator, Ruler, Graphing papers, and Worksheets

SHOW ME

Presentation of Information

The teacher will let the students draw a scatter, manually, for example 1.

Then the teacher will discuss how to draw a scatter plot in the calculator and how to find the equation of the line of best fit for a given data.

Example 1: Find the equation of the line of best fit for the data obtained in a study of age and systolic blood pressure of six randomly selected subjects. The data are shown in the table.

|  |  |  |
| --- | --- | --- |
| Subject | Age (x) | Pressure (y) |
| A | 43 | 128 |
| B | 48 | 120 |
| C | 56 | 135 |
| D | 61 | 143 |
| E | 67 | 141 |
| F | 70 | 152 |

Questions:

1. What is the blood pressure of a 23-year old person? A 38-year old person?
2. Estimate the age of a person with a pressure of 180, 200, and 160.

Example 2: Find the equation of the line of best fit for the data obtained in a study on the number of absences and the final grades of seven randomly selected students from a statistics class. The data are shown here.

|  |  |  |
| --- | --- | --- |
| Student | Number of Absences (x) | Final Grade (y) |
| A | 6 | 82 |
| B | 2 | 86 |
| C | 15 | 43 |
| D | 9 | 74 |
| E | 12 | 58 |
| F | 5 | 90 |
| G | 8 | 78 |

Questions:

1. What would be the grade of a student who missed 20 days? Present all the time?
2. Estimate the number of days that a student missed if his/her grade is
   1. 70
   2. 50
   3. 99

Classwork

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: March 31, 2011

In each of the following draw a scatter plot for the variables and find the equation of the line of best fit.

1. A manager wishes to find out whether there is a relationship between the number of radio ads aired per week and the amount of sales (in thousands) of a product. The data of the sample is shown.
2. What is the amount of sales when the number of ads is 20?
3. Estimate the number of ads needed in order to have a sale of $18,000.

|  |  |
| --- | --- |
| No. of ads (x) | Sales (y) |
| 2 | 2 |
| 5 | 4 |
| 8 | 7 |
| 8 | 6 |
| 10 | 9 |
| 12 | 10 |

1. A researcher wishes to determine if a person’s age is related to the number of hours he or she exercises per week. The data of the sample is shown here.
2. Determine the number of hours spent by a
   1. 40 year old
   2. 28 year old

|  |  |
| --- | --- |
| Age (x) | Hours (y) |
| 18 | 10 |
| 26 | 5 |
| 32 | 2 |
| 38 | 3 |
| 52 | 1.5 |
| 59 | 1 |

1. A study is conducted to determine the relationship between a person’s monthly income in dollars and the number of meals that a person eats away from home per month. The data from the sample is shown here.

Determine the number of times that a person eats away from home if his salary is

1. $3,000
2. $4,000

|  |  |
| --- | --- |
| Income (x) | Meals (y) |
| 500 | 8 |
| 1200 | 12 |
| 1500 | 16 |
| 945 | 10 |
| 850 | 9 |
| 400 | 3 |
| 540 | 7 |

1. The director of an alumni association of a small college wants to determine whether there is any type of relationship between the amount of an alumnus’s contribution (in dollars) and the years the alumnus has been out of school. The data follow.

What is the expected contribution of an alumnus who has been out of school for

1. 12 years?
2. 15 years?

|  |  |
| --- | --- |
| Years (x) | Contribution (y) |
| 1 | 500 |
| 5 | 100 |
| 3 | 300 |
| 10 | 50 |
| 7 | 75 |
| 6 | 80 |

1. A store manager wishes to find out whether there is a relationship between the age of her employees and the number of sick days they take each year. The data for the sample are shown.

Estimate the age of the employee who has the following number of absences.

1. 20 days
2. 7 days

|  |  |
| --- | --- |
| Age (x) | Days (y) |
| 18 | 16 |
| 26 | 12 |
| 39 | 9 |
| 48 | 5 |
| 53 | 6 |
| 58 | 2 |

1. An educator wants to see how strong the relationship is between a student’s score on a test and his/her grade-point average. The data obtained from the sample are shown.

|  |  |
| --- | --- |
| Test score (x) | GPA (y) |
| 98 | 2.1 |
| 105 | 2.4 |
| 100 | 3.2 |
| 100 | 2.7 |
| 106 | 2.2 |
| 95 | 2.3 |
| 116 | 3.8 |
| 112 | 3.4 |

Classwork

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: April 1, 2011

In each of the following draw a scatter plot for the variables and find the equation of the line of best fit.

1. A manager wishes to find out whether there is a relationship between the number of radio ads aired per week and the amount of sales of a product. The data of the sample is shown.
2. What is the amount of sales when the number of ads is 20?
3. Estimate the number of ads needed in order to have a sale of $18,000.

|  |  |
| --- | --- |
| No. of ads (x) | Sales (y) |
| 2 | $2000 |
| 5 | $4000 |
| 8 | $7000 |
| 8 | $6000 |
| 10 | $9000 |
| 12 | $10000 |

1. A researcher wishes to determine if a person’s age is related to the number of hours he or she exercises per week. The data of the sample is shown here.
2. Determine the number of hours spent by a
   1. 40 year old
   2. 28 year old

|  |  |
| --- | --- |
| Age (x) | Hours (y) |
| 18 | 10 |
| 26 | 5 |
| 32 | 2 |
| 38 | 3 |
| 52 | 1.5 |
| 59 | 1 |

1. A study is conducted to determine the relationship between a person’s monthly income in dollars and the number of meals that a person eats away from home per month. The data from the sample is shown here.

Determine the number of times that a person eats away from home if his salary is

1. $3,000
2. $4,000

|  |  |
| --- | --- |
| Income (x) | Meals (y) |
| 500 | 8 |
| 1200 | 12 |
| 1500 | 16 |
| 945 | 10 |
| 850 | 9 |
| 400 | 3 |
| 540 | 7 |

1. The director of an alumni association of a small college wants to determine whether there is any type of relationship between the amount of an alumnus’s contribution (in dollars) and the years the alumnus has been out of school. The data follow.

What is the expected contribution of an alumnus who has been out of school for

1. 12 years?
2. 15 years?

|  |  |
| --- | --- |
| Years (x) | Contribution (y) |
| 1 | 500 |
| 5 | 100 |
| 3 | 300 |
| 10 | 50 |
| 7 | 75 |
| 6 | 80 |

1. A store manager wishes to find out whether there is a relationship between the age of her employees and the number of sick days they take each year. The data for the sample are shown.

Estimate the age of the employee who has the following number of absences.

1. 20 days
2. 7 days

|  |  |
| --- | --- |
| Age (x) | Days (y) |
| 18 | 16 |
| 26 | 12 |
| 39 | 9 |
| 48 | 5 |
| 53 | 6 |
| 58 | 2 |

1. An educator wants to see how strong the relationship is between a student’s score on a test and his/her grade-point average. The data obtained from the sample are shown.

|  |  |
| --- | --- |
| Test score (x) | GPA (y) |
| 98 | 2.1 |
| 105 | 2.4 |
| 100 | 3.2 |
| 100 | 2.7 |
| 106 | 2.2 |
| 95 | 2.3 |
| 116 | 3.8 |
| 112 | 3.4 |