

2. Analysis of data from a statistical study shows a linear relationship in the data with a correlation coefficient of  $-0.524$ . Which statement best summarizes this result?

- 1) There is a strong positive correlation between the variables.
- 2) There is a strong negative correlation between the variables.
- 3) There is a moderate positive correlation between the variables.
- 4) There is a moderate negative correlation between the variables.

3. A nutritionist collected information about different brands of beef hot dogs. She made a table showing the number of Calories and the amount of sodium in each hot dog.

Calories per Beef Hot Dog	Milligrams of Sodium per Beef Hot Dog
186	495
181	477
176	425
149	322
184	482
190	587
158	370
139	322

- a) Write the correlation coefficient for the line of best fit. Round your answer to the *nearest hundredth*.
- b) Explain what the correlation coefficient suggests in the context of this problem.

4. The table below shows 6 students' overall averages and their averages in their math class.

<b>Overall Student Average</b>	92	98	84	80	75	82
<b>Math Class Average</b>	91	95	85	85	75	78

If a linear model is applied to these data, which statement best describes the correlation coefficient?

- 1) It is close to  $-1$ .
- 2) It is close to  $1$ .
- 3) It is close to  $0$ .
- 4) It is close to  $0.5$ .

NORMAL FLOAT AUTO REAL RADIAN MP

**LinReg**

$y=ax+b$   
 $a=.8308927728$   
 $b=14.06896552$   
 $r^2=.8552020991$   
 $r=.9247713767$

Name \_\_\_\_\_  
Date \_\_\_\_\_

Period \_\_\_\_\_  
**Line of Best Fit**

What you will learn.... how to use the graphing calculator to make a scatter plot from a data set and then to find the equation of the line of best fit.

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LinReg

For example 1) The table shows the averages for homework grades and test scores students. Use a graphing calculator to find the equation of the line of best fit. Round a and b to the nearest **thousandth** and write the line of best fit in slope intercept

$y=ax+b$   
a=.5576716738  
b=39.79238197  
 $r^2=.6019726946$   
 $r=.7758689932$

$y = .558x + 39.792$

<b>Average Homework Grade</b>	75	85	94	88	91	95	76	84	90
<b>Average TEST scores</b>	83	87	95	93	88	91	83	80	92

2) The table shows the population of the United States from the year 1970 through the year 2010.

x  
y

<b>Year</b>	1970	1975	1980	1985	1990	1995	2000	2005	2010
<b>Population (In Millions)</b>	205	215	228	238	250	267	282	295	308

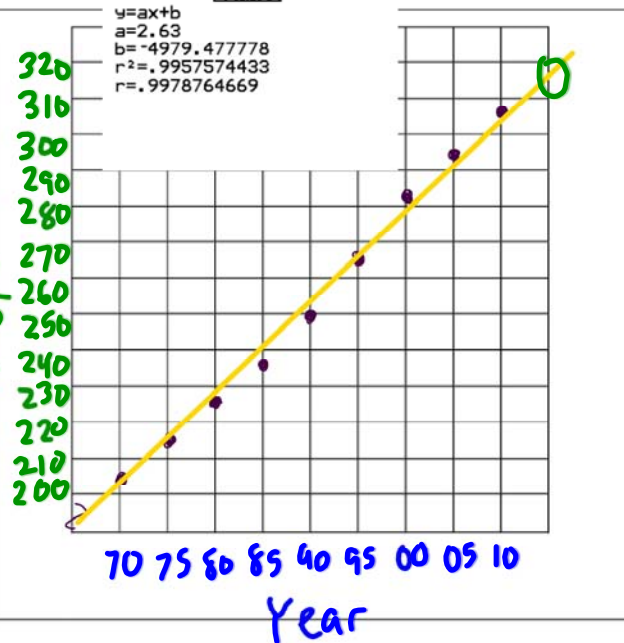
NORMAL FLOAT AUTO REAL RADIAN HP

LinReg

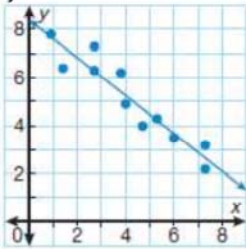
- a) Draw a scatter plot and a trend line for the data.
- b) Use the trend line to make a prediction for the population in the year 2015. **316**
- c) Find the equation of the line of best fit using your graphing calculator. Round the values of a and b to the nearest thousandth.
- d) Use this equation to estimate the population in the year 2015. Round your answer to the nearest million.

$y = 2.63x - 4979.478$

**320 million**



3) State whether there is a positive correlation, a negative correlation, or no correlation between the data values.

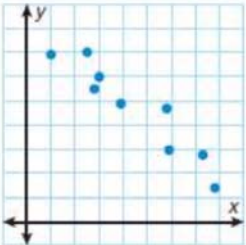
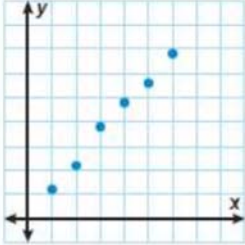
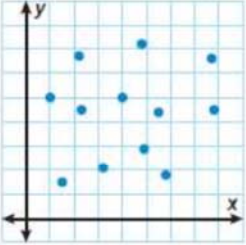
<p>a)</p> 	<p>b)</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px 5px;"><b>x</b></td> <td style="padding: 2px 5px;">2</td> <td style="padding: 2px 5px;">5</td> <td style="padding: 2px 5px;">6</td> <td style="padding: 2px 5px;">8</td> <td style="padding: 2px 5px;">9</td> <td style="padding: 2px 5px;">11</td> <td style="padding: 2px 5px;">13</td> <td style="padding: 2px 5px;">16</td> <td style="padding: 2px 5px;">20</td> </tr> <tr> <td style="padding: 2px 5px;"><b>y</b></td> <td style="padding: 2px 5px;">10</td> <td style="padding: 2px 5px;">12</td> <td style="padding: 2px 5px;">13</td> <td style="padding: 2px 5px;">15</td> <td style="padding: 2px 5px;">17</td> <td style="padding: 2px 5px;">20</td> <td style="padding: 2px 5px;">21</td> <td style="padding: 2px 5px;">24</td> <td style="padding: 2px 5px;">26</td> </tr> </table>	<b>x</b>	2	5	6	8	9	11	13	16	20	<b>y</b>	10	12	13	15	17	20	21	24	26
<b>x</b>	2	5	6	8	9	11	13	16	20												
<b>y</b>	10	12	13	15	17	20	21	24	26												
<p>c) the outdoor temperature and the number of sweaters sold in a store</p>	<p>d) hair color and height</p>																				

4) Match each situation with the scatter plot that models it best.

e) time spend exercising and calories burned. \_\_\_\_

f) the number of dishes washed and the number of ounces of detergent remaining in a bottle. \_\_\_\_

g) the population of a country and the number of states in the country. \_\_\_\_

<p><b>I</b></p> 	<p><b>II</b></p> 	<p><b>III</b></p> 
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**More Practice!**

1.

The data table below shows the median diameter of grains of sand and the slope of the beach for 9 naturally occurring ocean beaches.

$L_1$	<b>Median Diameter of Grains of Sand, in Millimeters (x)</b>	0.17	0.19	0.22	0.235	0.235	0.3	0.35	0.42	0.85
$L_2$	<b>Slope of Beach, in Degrees (y)</b>	0.63	0.7	0.82	0.88	1.15	1.5	4.4	7.3	11.3

Write the linear regression equation for this set of data, rounding all values to the *nearest thousandth*. Using this equation, predict the slope of a beach, to the *nearest tenth of a degree*, on a beach with grains of sand having a median diameter of 0.65 mm.

$$y = 17.159x - 2.476$$

$$17.159(.65) - 2.476 \rightarrow$$

$$8.7^\circ$$

NORMAL FLOAT AUTO REAL RADIAN MP

**LinReg**

$y = ax + b$

$a = 17.15936928$

$b = -2.475925196$

$r^2 = .9104867482$

$r = .9541942927$

HW 2

Omar has a piece of rope. He ties a knot in the rope and measures the new length of the rope. He then repeats this process several times. Some of the data collected are listed in the table below.

<b>Number of Knots</b>	4	5	6	7	8
<b>Length of Rope (cm)</b>	64	58	49	39	31

State, to the *nearest tenth*, the linear regression equation that approximates the length,  $y$ , of the rope after tying  $x$  knots. Explain what the  $y$ -intercept means in the context of the problem. Explain what the slope means in the context of the problem.