

1. Explain the difference between a trend line and a line of best fit.
 Line of Best fit: Line of Best fit: Calculated.
 Trendline: eye-balled

2. The table shows number of hours spent studying for a science test and final test score.

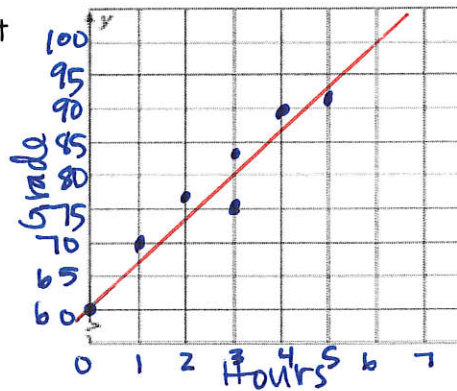
Study Hours	3	2	5	1	0	4	3
Grade	84	77	92	70	60	90	75

a. Draw a scatter plot of the data and a line of fit (trend line).

b. Write a **linear function** for the line of BEST fit and interpret the correlation coefficient. Is the line a good fit? Explain.

$y = 6.3x + 62$

Yes, $r = .956$ which is a strong r



c. Predict the grade of a student who studied 6 hours.

$y = 6.3(6) + 62 = 99.8$

d. Is this interpolation or extrapolation?

Extrapolation - outside given data values

3. The table shows the average and maximum longevity of various animals in captivity.

Longevity (years)								
Avg.	12	25	15	8	35	40	41	20
Max.	47	50	40	20	70	77	61	54

a. Draw a scatter plot and determine what relationship, if any, exists in the data.

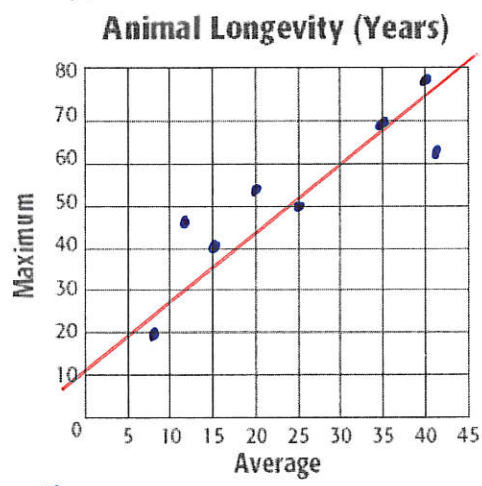
positive correlation

b. Draw a line of fit (trend line) for the scatterplot, then use your calculator to write the linear function of the line of BEST fit and interpret the correlation coefficient.

$y = 1.22x + 22.4$

c. Is the line a good fit? Explain.

Yes, $r = .881$ which is fairly strong



d. Predict the maximum longevity for an animal with an average longevity of 33 years.

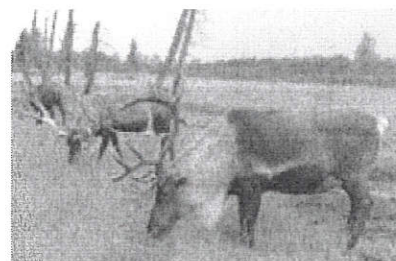
$y = 1.22(33) + 22.4 = 62.66$

e. Is this interpolation or extrapolation?

Interpolation - within known data values

4. A herd of caribou moved to a small remote island where they had no predators. Data on the population of the herd was collected for 6 years.

Time (years)	0	1	2	3	4	5	6
Population	24	35	51	74	104	151	225



a. Write the equation for the **line** of best fit.

(linear regression) $y = 31.7x - 0.29$

b. $r = \underline{.95}$

c. Write the equation for the **curve** of best fit.

(exponential regression) $y = 24.1(1.45)^x$

d. $r^2 = \underline{.9997}$

e. Is the linear or exponential regression a better fit for the data?

Linear

Exponential

r^2 is closer to 1

f. Using the equation that best fits the data, predict how many caribou there will be in 9 years.

$y = 24.1(1.45)^9 \approx 683$ caribou

g. Is this interpolation or extrapolation?

Extrapolation - outside known data values

5. Use the data in the table to answer the questions.

x	1	1	2	5	4	4	3	6
y	9	3	8	4	3	2	6	8

a. Write the equation for the **line** of best fit.

(linear regression) $y = -0.24x + 6.17$

b. $r = \underline{-0.165}$

c. Write the equation for the **curve** of best fit.

(exponential regression) $y = 5.4(.959)^x$

d. $r^2 = \underline{0.018}$

e. Is the linear or exponential regression a better fit for the data?

Linear

Exponential

Farther from 0

f. Using the equation that best fits the data, predict y when x is 3.

$-0.24(3) + 6.17 = 5.45$

g. Is this interpolation or extrapolation?

Interpolation - within known values