TRENDS AND CORRELATION COEFFICIENTS: GUIDED NOTES

Directions

Use the tables to find a pattern of how the y-values increase or decrease. Write a general rule next to each table (ex. + 4, · 2, etc.).

Tickets	Cost
1	$15.00
2	$30.00
3	$45.00
4	$60.00
5	$75.00

Hours	Bacteria
1	2
2	6
3	18
4	54
5	162

Weeks	Pounds
2	100
4	95
6	90
8	85
10	80

Minutes	Temp.
0	200
1	150
2	112.5
3	84.375
4	63.28125

Field Goals	Points
5	10
8	16
11	22
14	28
17	34

Time (min.)	Tylenol (mg)
30	250.445
60	209.076
90	174.540
120	145.710
150	121.641

Observations

The data in the tables on the left is linear. Why do you think we use that word for it?

The data on the right is nonlinear—more specifically, it is exponential.

Using the table, how can you determine if a data set is linear? is exponential?

- It is linear if…

- It is exponential if…

Linear or Exponential (Formalize Your Findings)

- If a scatter plot **can** be represented with a straight line, then we say that the trend is

  _____.

- If a scatter plot **cannot** be represented with a straight line, then we say that the trend is

  _____.

- When a data set is *linear*, the y-values change by _____.

- When a data set is *exponential*, the y-values change by _____.

Linear Regression

Your calculator uses *linear regression* to find a line of best fit, which is also known as a *linear regression model*.

- a represents the _____ of the line.

- b represents the _____ of the line.

- r is the *correlation coefficient*. This r-value shows _____.

- The closer the r-value is to _____ or _____, the better the line fits the data.

Example

Week	Account Balance
1	$4.00
2	$8.00
3	$12.00
4	$16.00
5	$20.00

You are saving money to buy a video game. The table shows your account balance at the end of each week. Is the data linear or not linear? How can you tell from the table?

Find the linear regression model for your account balance and write it in the form $y = mx + b$.

Give the correlation coefficient and explain its meaning.

Predict the amount of money in your account after 10 weeks.