Name: _____   Period: _____

Checkpoint 5A   *Integrated Math 2*

To understand the population of squirrels living near her house, Marissa counts the number of squirrels in portions of a nearby prairie. The table is a report of her findings. Use it to answer questions 1 through 5.

Acres of Prairie	Number of Squirrels
4	9
9	1
11	3
15	46
19	99
23	67
29	92
46	178
49	102
59	118

1) Create a scatter plot that displays the number of squirrels in each acre. Sketch it in the space below. Use a calculator for help.

⊞ TI-NSPIRE: Press Home → New Document → Add Lists & Spreadsheet. Enter your data into both columns. Be sure to label each column. Press ctrl + doc → Add Data & Statistics. Add the data to the horizontal and vertical axis.

2) Using the calculator, perform a linear regression. Draw the line of best fit on the scatter plot you sketched above.

⊞ TI-NSPIRE: Press Menu → Analyze → Regression → Show Linear (mx+b).

3) Just by looking at the line on the scatter plot, does it appear that this line is a good fit for the data? Explain your answer.

4) Create a residual plot. Sketch it in the space below. Based on the residual plot, does it appear that a linear function is a good fit for the data?

⊞ TI-NSPIRE: Press Menu → Analyze → Residuals → Show Residual Plot.

5) What is the sum of the squares of the residuals? Explain the meaning.
⊞ TI-NSPIRE: Press Menu → Analyze → Residuals → Show Residual Squares.

Last year, Brian got his first job and started depositing money into his bank account. He recorded his balance every month. The table represents his bank account balance every month after he started his job. Use it to answer questions 6 through 10.

Months of Work	Money in Account
1	$560
2	$570
3	$606
4	$636
5	$672
6	$701
7	$744
8	$770

6) Create a scatter plot that displays the amount of money in Brian's bank account after each month. Sketch it in the space below.

7) Brian says that his bank account balance can be estimate by using the equation $y = 30x + 500$. Draw this line on your scatter plot above (use a calculator as a guide). Just by looking at the line on the scatter plot, does it appear that it's a good fit for the data? Explain you answer.

⊞ TI-NSPIRE: Press Menu → Analyze → Plot Function.

8) Create a residual plot. Sketch it in the space below. Based on the residual plot, does it appear that this is a good fit for the data?

9) Use a calculator to perform a linear regression. Add that line to your sketch above. (Tip: Be sure to remove the previous line)

10) Determine the sum of the squares of the residuals for the linear regression in question #9. Does this line fit the data better than the linear regression found in question #5? Explain your comparison.

11) Use a calculator to determine which function best represents the data in the table: linear, quadratic, or exponential.

a.

x	-5	-4	-3	-2	-1	0
f(x)	0.0	0.2	0.8	1.8	3.2	5.0

b.

x	0	1	2	3	4	5
f(x)	3	4	6	10	18	34