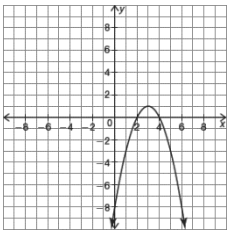
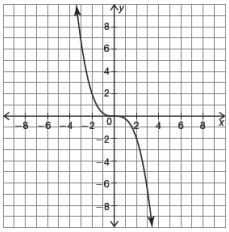
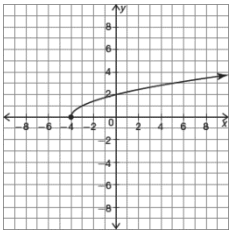
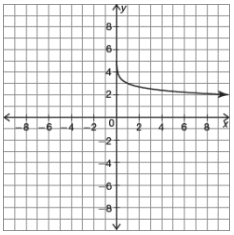
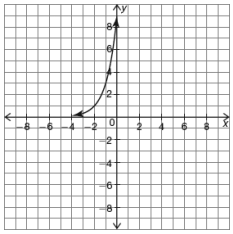
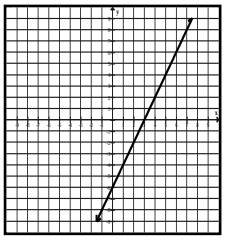
PAP Algebra 2
Regression Practice **Name: _____**

1. Determine the function family represented by each graph.

2. Determine if each table represents a linear, quadratic, or exponential function. Explain how you know.

X	Y
0	5
1	10
2	20
3	40
4	80

X	Y
0	5
1	6
2	9
3	14
4	21

X	Y
0	5
1	7
2	9
3	11
4	13

3. Use a calculator to determine the quadratic equation that best models the data.

x	0.2	0.61	1.2	2.9	3.9
y	20.1	34.4	49.6	56.5	34.2

4. Use a calculator to determine the exponential equation that best models the data.

x	10.1	17.8	24.6	30.2	35.3
y	559	1205	2373	4146	6892

REGRESSION

Enter the data:
STAT 1: edit
type the x values into L_1
type the y-values into L_2

Equation:
STAT Calc
4: LinReg
5: QuadReg
0: ExpReg

ENTER

5. Use the calculator to determine the linear equation that best models the data.

x	1.6	3.4	6.1	8.7	11.5
y	415	342	231	140	34.1

How to create a scatter plot on your calculator:

Enter the data:
STAT 1: edit type the x values into L_1 and the y-values into L_2
Turn on Stat Plot:
2^{nd} y = 1 Enter
Graph
Zoom 9

Create a scatterplot on your calculator and analyze the data to determine the best regression model for the data. Explain your reasoning. Then, use a graphing calculator to determine the regression equation.

6. The average salary in thousands of dollars, $s(x)$, of a company's presidents for various years since 1960 is displayed in the table.

Time Since 1960 (years)	0	5	10	15	16	17	18
Average Salary (thousands of dollars)	170	325	750	1900	2000	2200	2600

7. The number of units produced, x, of a product and the profit associated with making that many units, $P(x)$, in thousands of dollars, are shown in the table.

Number of Units Produced	1280	1350	1500	1725	1960	2400	2650	2800
Profit (thousands of dollars)	1180	1170	1280	1560	1720	1960	1940	1800

8. The table shows the number of oriental rugs a company sells, $n(x)$, and the price of each rug, x.

Price (dollars)	160	180	200	220	240	260	280
Number of Rugs	125	100	85	75	60	40	20

9. A college recorded the number of hours students studied for a math entrance exam, x, and their scores on the exam, $s(x)$. The results are shown in the table.

Study Time (hours)	1	3	4	9	10	12	13	14	16
Exam Score	350	400	490	580	650	600	700	730	770

10. A 75-gallon tank begins to leak and lose water. The table shows the amount of water left in the tank $a(x)$ after x minutes since the leak started.

Time Since Leak Started (minutes)	0	5	10	15	20	25	30
Amount of Water in the Tank (gallons)	75	45	27	18	13	8	7

11. A car dealership studies the average fuel economy of one of its vehicles, $f(x)$, in miles per gallon, for various speeds, x, in miles per hour. The table shows the results.

Speed (miles per hour)	20	25	30	35	40	45	50	55	60	65
Fuel Economy (miles per gallon)	25.6	27.8	29.1	29.2	30.1	29.8	30.1	29.9	28.5	26.1

A new customer wants to average 28.5 miles per gallon. Write a regression equation that best models the data, and use the equation to predict the fuel economy for a speed of 40 miles per hour.

12. A small business conducts a study to see if the amount of money spent on monthly advertising, x, in hundreds of dollars, is related to the amount of monthly sales $s(x)$, in hundreds of dollars. The table shows the results.

Monthly Advertising Expenditures (hundreds of dollars)	5.6	5.8	5.9	6.1	6.2	6.3	6.4	6.5	6.6
Monthly Sales (hundreds of dollars)	105	110	114	113	117	116	121	120	125

The company wants to have sales of $12,500. Write a regression equation that best models the data, and use the equation to predict the amount of money the company will have to spend for advertising each month in order to generate $12,500 in sales.

13. The amount of medicine in the body, $m(x)$, in milligrams/milliliter, x minutes after taking it, is shown in the table.

Time Since Taking Medicine (minutes)	0	1	4	7	10	13	16	19
Amount of Medicine (milligrams/milliliter)	10.5	9.8	8.4	7.3	6.3	5.5	4.8	4.6

Write a regression equation that best models the data, and use the equation to predict the number of minutes that the medicine has been in the system if there is 7.5 milligrams/milliliter left.

14. A hospital notices that flu cases are on the rise and begins to track the number of flu patients. The table shows the number of flu cases, $f(x)$, and the time in days since the hospital started tracking the data, x.

Time (days)	0	2	4	6	8	10
Number of Flu Cases	1500	1610	1650	1590	1550	1490

Write a regression equation that best models the data, and use the equation to predict the number of flu cases the hospital can expect 12 days after it started tracking.