REGRESSIONS – Day 1

Recall that when scatter plots have a positive or negative correlation, you can draw a trend line to estimate the data. The trend line that shows the relationship between two sets of data most accurately is called the **line of best fit**. A graphing calculator computes the equation of the line of best fit using a method called **regression**.

Example 1: The scatterplot shows a comparison between the test grades for 8 students in a history class and the time each student spent studying.

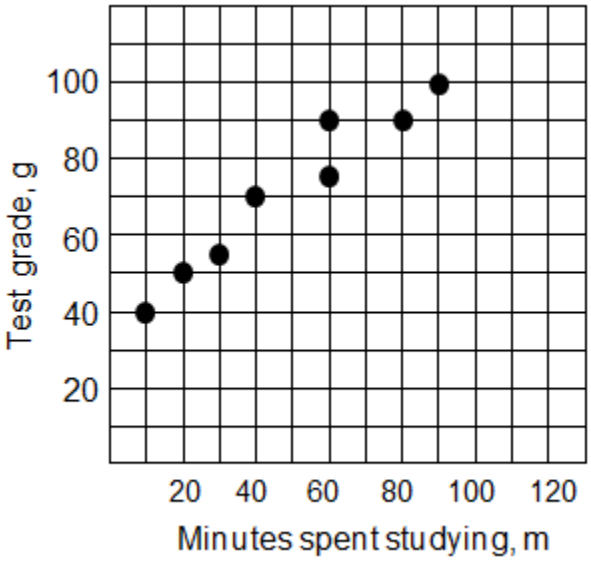
a) What type of correlation does the scatterplot show?

b) Make a table representing the relationship.

m	g

c) Use linear regression in the calculator to find the equation of the line of best fit. Round values to the nearest hundredth.

y = _____



Example 2: The scatterplot shows the monthly high temperatures for Austin, Texas, in degrees Fahrenheit over a 12-month period.

a) Which month had the highest temperature?

b) What was the lowest monthly high temperature during the year?

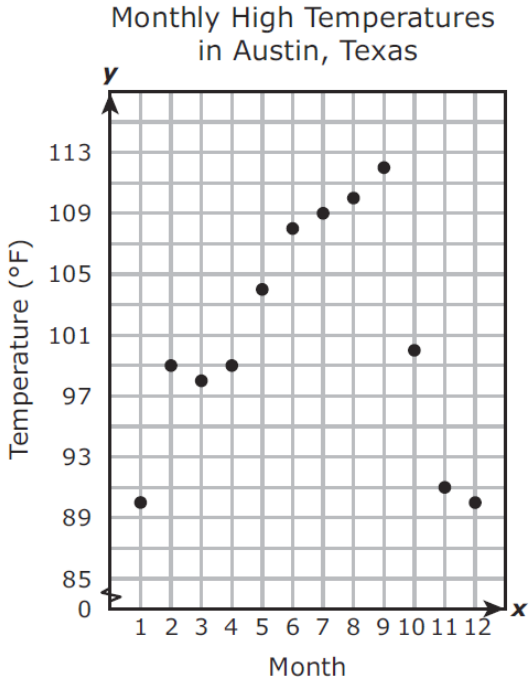
c) Which function best models the data from Month 1 to Month 9?

A. y = –1.6x + 111

B. y = 3.5x + 85

C. y = 2.5x + 90

D. y = –3.3x + 130



3) The table below contains some points on the graph of a quadratic function.

x	y
-2	7
-1	4
2	7
3	12

Use regression in the calculator to find a function that represents the same relationship.

y = _____

4) The table below models an exponential relationship between x and y.

x	y
-1	1/3
0	1
2	9
3	27

Use regression in the calculator to find an equation that models this relationship.

y = _____

If the problem does not specify linear, quadratic, exponential, etc., turn "Diagnostic On" in your calculator. Here's how:

[2ND] [0] [x^{-1}] DiagnosticOn [ENTER] [ENTER]

(the "D" button)

Now when you perform regressions, the calculator will show you the **coefficient of determination** r^2, which tells you how closely the equation models the data.

If $r^2 = 1$, the equation is a perfect fit for the data.

Use regression in the calculator to determine which equation models the relation shown.

5)

x	-6	-3	0	3	6
y	2	3	4	5	6

Lin / Quad / Exp

y = _____

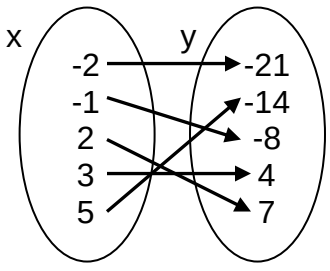
6)

x	-3	-2	-1	1	2
y	8	4	2	.5	.25

Lin / Quad / Exp

y = _____

7)



Lin / Quad / Exp

y = _____

8)

x	y
-7	30
-4	-3
-2	-15
1	-18

Lin / Quad / Exp

y = _____