LINEAR REGRESSION WORKSHEET #1

Name_____ **Date**_____ **Period**_____

1. A convenience store manager notices that sales of soft drinks are higher on hotter days, so he assembles the data in the table.

(a) Make a scatter plot of the data.

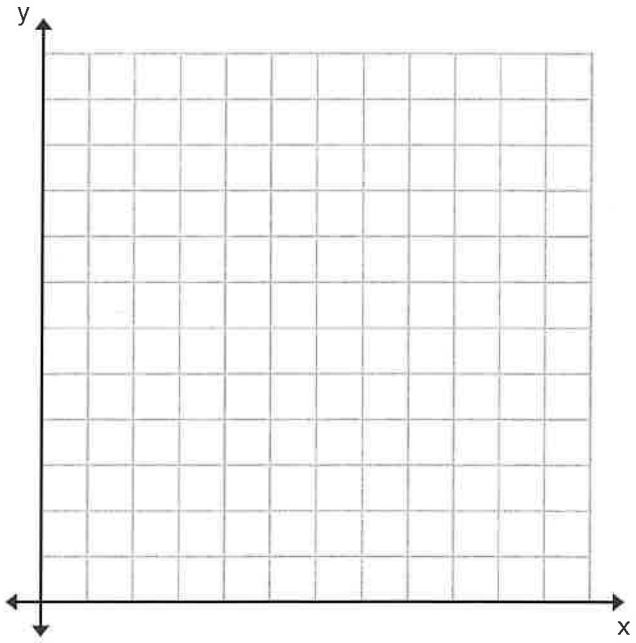
(b) Find and graph a linear regression equation that models the data.

Equation:_____

High Temperature (°F)	Number of cans sold
55	340
58	335
64	410
68	460
70	450
75	610
80	735
84	780

(c) Use the model to predict soft-drink sales if the temperature is 95°F.

(d) Using the scatterplot, describe the association you see between the two variables. Make sure to mention form, direction and strength.



2. Anthropologists use a linear model that relates femur length to height. The model allows an anthropologist to determine the height of an individual when only a partial skeleton (including the femur) is found. In this problem, we find the model by analyzing the data on femur length and height for the ten males given in the table.

(a) Make a scatter plot of the data.

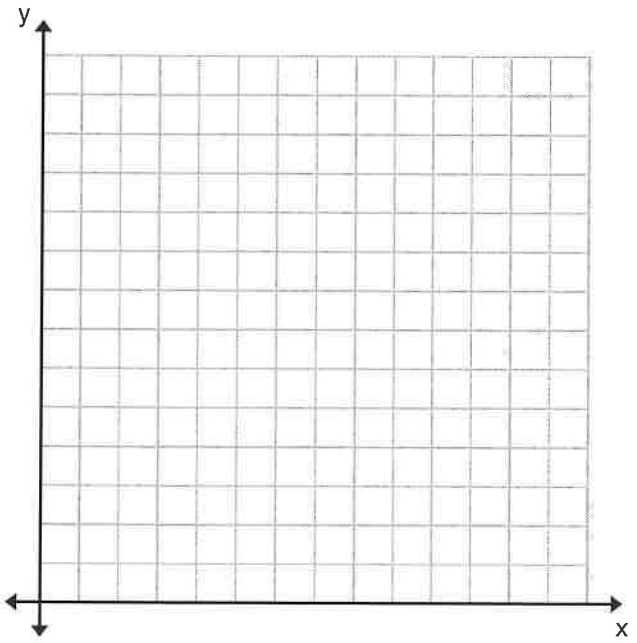
(b) Find and graph a linear regression equation that models the data.

Femur Length (cm)	Height (cm)
50.1	178.5
48.3	173.6
45.2	164.8
44.7	163.7
44.5	168.3
42.7	165.0
39.5	155.4
38.0	155.0

Equation: _____

(c) An anthropologist finds a femur of length 58 cm. How tall was the person?

(d) Using the scatterplot, describe the association you see between the two variables. Make sure to mention form, direction and strength.



Quadratic Regression Practice Worksheet

Name_____ **Date**_____

Amery recorded the distance and height of a basketball when shooting a free throw.

Distance(feet), x	Height (feet), f(x)
0	4
2	8.4
6	12.1
9	14.2
12	13.2
13	10.5
15	9.8

1. Find the quadratic equation for the relationship of the horizontal distance and the height of the ball. Round to 3 decimal places.

2. Using this function what is the approximate maximum height of the ball?

This table shows the population of a city every ten years since 1970.

Years Since 1970, x	Population (In thousands), y
0	489
10	801
20	1,202
30	1,998
40	2,959

3. Find the best-fitting quadratic model for the data. Round to 3 decimal places.

4. Using this model, what will be the estimated population in 2020?

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5. Which of the following is best modeled by a ***quadratic*** function?
   A. Relationship between circumference and diameter.
   B. Relationship between area of a square and side length.
   C. Relationship between diagonal of a square and side length.
   D. Relationship between volume of a cube and side length.

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6. If y is a quadratic function of x, which value completes the table?

x	-2	0	2	4	6
y	-8	0	12	28	

   A. 12
   B. 20
   C. 44
   D. 48

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7. The graph of a quadratic function having the form $f(x) = ax^2 + bx + c$ passes through the points **(0, -8), (3, 10),** and **(6, 34)**. What is the value of the function when **x = -3**?

A. -32 B. -26 C. -20 D. 10

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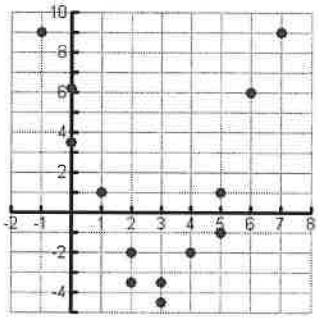
8. Which is the quadratic equation the best fits the scatterplot?



A. $f(x) = (x-3)^2 - 4$

B. $f(x) = (x+3)^2 + 4$

C. $f(x) = (x-4)^2 - 3$

D. $f(x) = (x+4)^2 + 3$

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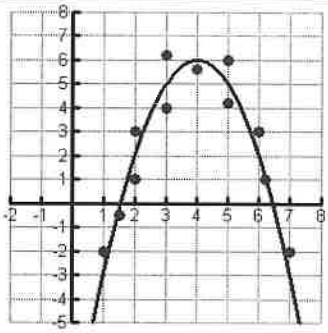
9. Which is the quadratic equation the best fits the scatterplot?



A. $f(x) = x^2 - 8x + 22$

B. $f(x) = -x^2 - 8x - 10$

C. $f(x) = -x^2 + 8x - 32$

D. $f(x) = -x^2 + 8x - 10$

Write a quadratic equation that fits each set of points.

10. (0. -8), (2, 0), and (-3, -5)

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11. (-1, -16), (2, 5), and (5, 8)

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12. (1, 4), (-2, 13), and (0, 3)

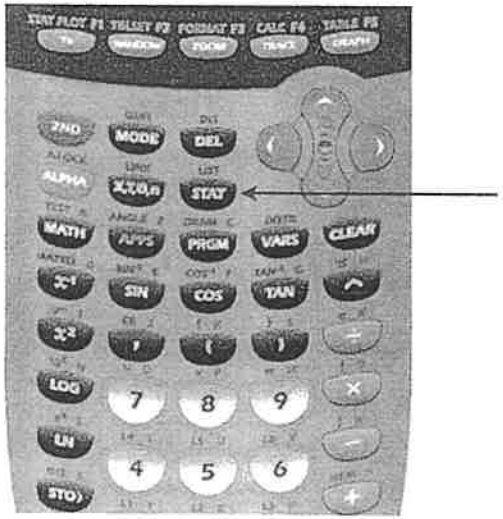
13.

x	-1	0	1	2	3
y	35	22	11	2	-5

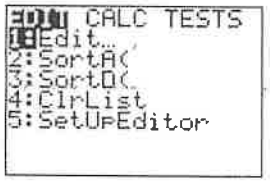
Calculator notes for finding a linear regression or quadratic regression on your calculator.
(LinReg, QuadReg)

When you are given a set of points and asked to find the equation of a line or a quadratic, you can use the STAT button your calculator to do this.

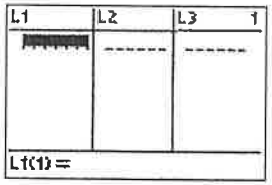
First, find the STAT button on your calculator.



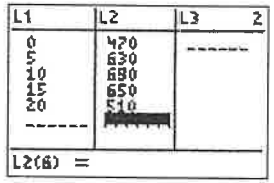
You should see this screen after you press the STAT button.



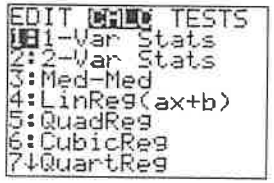
Press ENTER



Enter each x-value in the L1 column and the corresponding y-value in the L2 column. These stand for List 1 and List 2. You will need to press ENTER after each number to get it into the lists.



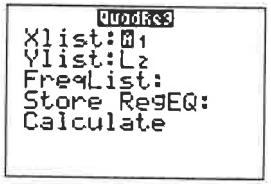
Now go back to your STAT menu by pressing STAT again. Move your cursor to highlight CALC.



As you look through the menu, you will see 4: LinReg (ax+b). You would choose that option if you were needing to find a linear equation.

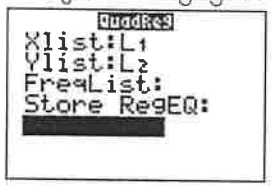
To find a quadratic equation, choose 5: QuadReg. Either cursor down to that line and hit ENTER, or press 5 on your calculator.

The newer calculators will look like this.



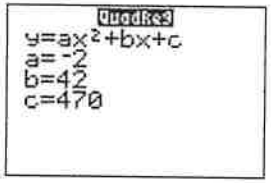
(The older calculators will have QuadReg on the screen. Just press ENTER.)

You will need to cursor down until you have highlighted "calculate".



(sorry, my screen capture made it all blacked out.

Press ENTER



You will have to write your answer in the proper form.

$y = -2x^2 + 42 + 470$

Easy Peasy!