Unit 3 - Quadratic Regressions

Name: ___Key___   Date: _____

SWBAT: __use calculator to find regression eqn__

Remember: Clear Memory and select Diagnostics ON on your calculator

1) The table show the relationship between calories and fat grams contained in orders of fried chicken from various restaurants. Assume the data is <u>linear.</u>

x = Calories	305	410	320	500	510	440
y =Fat grams	28	34	28	41	42	38

$y = $ ___.07x + 5.86___   (Round to 2 decimal places)

How many fat grams would be in a 275-calorie order of fried chicken? ___25.11 g___

2) The table shows the number of households with a telephone answering machine in selected years after 1980.

Years (x)	1984	1986	1988	1990	1992	1994	1996	19988
	4	6	8	10	12	14	16	18
Number of Households with Answering Machines	8.7	10.8	13.0	16.0	21.0	30.0	37.5	43.8

(Let x = # of years after 1980)

Using the data points, **which quadratic** equation *best* models the data? ___B___

A. $y = 8.4x^2 - 0.6x + 7.3$

(B.) $y = 0.15x^2 - 0.74x + 9.25$

C. $y = 0.2x^2 - 1.5x + 12$

D. $9 = -0.008x^2 + 0.79x - 1.39$

linear or quadratic?

3) The table below shows the cost of attending a private school for the years 1997- 2001. Let x = 0 in 1997. Which equation best represents the cost of the school? Use r^2 to determine

A. $y = 1{,}100x + 17{,}100$

B. $y = 214x - 70.3$

(C.) $y = 214.3x^2 + 242.9x + 17{,}528.6$

D. $y = -1.5x^2 - 70.3x$

$r^2 = .9453$

$r^2 = .995$

x   y

Year	Cost (dollars)
1997	17,500
1998	18,000
1999	19,000
2000	20,000
2001	22,000

0
1
2
3
4

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4) A ball is tossed from the top of a building. This table shows the height, h (in feet), of the ball above the ground t seconds after being tossed. Using a quadratic regression model, find

t	1	2	3	4	5	6
h	299	311	291	239	155	39

$y = \underline{-16x^2 + 60x + 255}$

According to a quadratic best-fit model of the data, how long after the ball was tossed was it 80 feet above the ground? __$5.67\ sec$__

$80 = -16x^2 + 60x + 255 \longrightarrow 0 = -16x^2 + 60x + 175$

✱ intersect

5) Five students in Miss Brown's algebra class reported the number of hours that they studied for a test. The number of hours and their test scores are in the table at the right. Assume the data is ~~linear.~~ (linear)

Hours of Study	Test Score
2	86
2.5	80
3	85
4.5	90
5	96

$y = \underline{3.91x + 74}$

y x

What is the predicted test score of a student who studied 1 hour for the test? ___B___

  A. 75   (B.) 78   C. 81   D. 84

6) A scientist recorded the growth (g) of pine trees and the amount of rainfall (r) they received their first year.

r (in.)	0	3	5	12	17	22	34	35	45
g (in.)	1	4	6	9.5	10.8	10.9	6	5.3	1

Which equation **best** fits the data? (The one with the r² closest to 100%) ___B___   linear or quadratic

  A) g = -0.017r + 6.38   (B)) g = -0.019r² + 0.797r + 1.94 $r^2 = .9288$?
  C.) g = 5.02(0.995)ʳ   D) g = -0.092r² + 1.62r + 2.51

$r^2 = .0049$

7) A toy rocket was fired straight up into the air and can be modeled by the equation $h = 5 + 90t - 16t^2$ (t, h)

  a. What is the maximum height obtained by the rocket? __$131.6\ ft$__ (Find vertex y =?)

      y

  b. How long does it take the rocket to reach its maximum height? $2.8\ sec$ (Find vertex x =?)

  c. When will the rocket be 121 feet in the air? __$2\ sec$__ (Find x when y = 121)

      $y = 121$ $3.625\ sec$