

Example 4 Which is the best quadratic model and why?

$y = ax^2 + bx + c$ $a = 26.746752$ $b = 36.41322651$ $c = 38.6280415$ $R^2 = .632546276$	$y = ax^2 + bx + c$ $a = 81.76190476$ $b = -49.952381$ $c = 45.2857143$ $R^2 = .202316189$	$y = ax^2 + bx + c$ $a = 2.44047619$ $b = -.416666667$ $c = 8.428571429$ $R^2 = .996525575$	$y = ax^2 + bx + c$ $a = 0$ $b = .27$ $c = 3.45$ $R^2 = 1$
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Quadratic Regression

Regression is the process of finding the line (or curve) of best fit for a set of data.

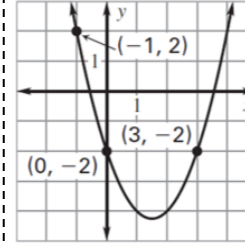
Coefficient of Determination:

R^2 is a number between 0 and 1 that describes the strength of the correlation. The higher the value, the closer the points are to the line of best fit.

*Use this method to write a quadratic equation if vertex/x-int are not easily identifiable

*makes a STANDARD form equation

Example 1 Write a quadratic function in standard form



L1	L2	L3	Z
-1	2		
0	-2		
3	-2		

L2(4) =

QuadReg

$y = ax^2 + bx + c$

a =

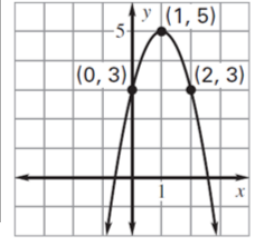
b =

c =

R² =

Graphing Calculator

2nd, 0, "Diagnostic On", enter, enter
 STAT → Edit
 Enter x's in L1, y's in L2
 STAT → Calc → QuadReg



L1	L2	L3	Z

L2(4) =

QuadReg

$y = ax^2 + bx + c$

a =

b =

c =

R² =

L1	L2	L3	Z
24	0		
28	1		
33	2		
41	3		
54	4		
74	5		

L2(7) =

QuadReg

$y = ax^2 + bx + c$

a =

b =

c =

Using the model, how many participants are projected for 2008?

Year, t	Participants, y
0	24
1	28
2	33
3	41
4	54
5	74

Youth Football The following table shows the number of participants y in the local youth football program from 2000 to 2005. Assume that t is the number of years since 2000.

Example 2 Use quad reg to make predictions

1) Write the equation:

2) Use the equation to find the number of participants:

Step 1: find equation

Price (\$)	Profit (\$)
150	8,750
170	14,995
263	14,625
297	12,730
320	4,370

Step 2: find vertex

Step 3: interpret solution

Trek Bicycle Company has designed a new style of mountain bike to sell. The table shows the price (x) at which the bike will be sold and the profit (y) that the company will make on the bikes sold at that price. Determine the best price to sell the bike so the company earns the most profit. How much do you trust this prediction, and why?

QuadReg	$y = ax^2 + bx + c$
a =	-1.4937663846
b =	677.0717299
c =	-581.970742
R ² =	.879298702

Round to 3 decimal places