Name: Answer Period: Date:

Practice Worksheet: Quadratic Regression

Write the quadratic function in standard form whose graph passes through the given points.

1] $(1,-2),(-2,1),(3,6)$

X	Y	
-2	1	3
1	-2	-8
3	6	

$y = x^2 - 3$

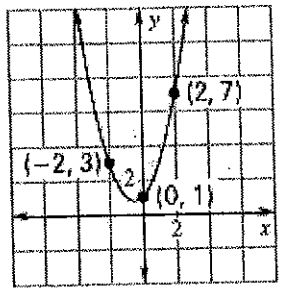
2] $(2,6),(-2,-2),(1,1)$

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

3] $(-2,7),(-1,3),(3,7)$

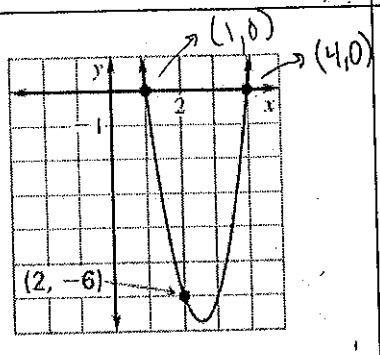
$y = x^2 - x + 1$

4]



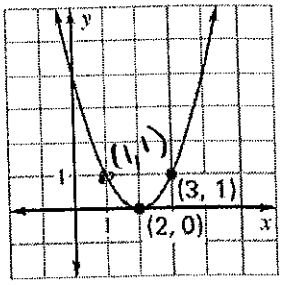
$y = x^2 + x + 1$

5]



$y = 3x^2 - 15x + 12$

6]



$y = x^2 - 4x + 4$

7] Find a function of the form $y = ax^2 + bx + c$ whose graph passes through (1, -4), (-3, -16) and (7, 14). Explain what the model tells you about the points.

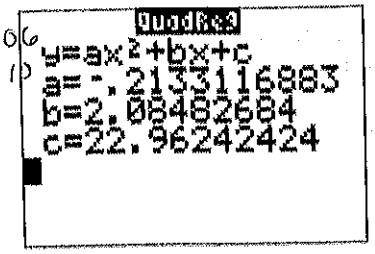
X	Y	
-3	-16	12/4 = 3
1	-4	
7	14	18/6 = 3

$y = 3x - 7$

This equation tells us that the line would be linear

The table shows the population of a town from 1996 to 2004. Assume that t **is the number of years since 1996** and P is measured in thousands of people.

Year, t	0	1	2	3	4	5	6	7	8
Population, P	22.8	25.0	26.5	27.1	27.8	28.1	27.9	26.9	26.1



8] Use the results from the regression shown to find the best-fitting quadratic model for the data. Round to **two** decimal places. Then use the model to find the population in 2007. Show your work.

$y = -.21x^2 + 2.08x + 22.96$

$P = -.21t^2 + 2.08t + 22.96$

$-.21(11)^2 + 2.08(11) + 22.96 = 20.43$

can plot pts on graph to create actual line, then grab pts actually on line to create new pts in table

The table shows the operating costs of a small business from 2000 to 2005. Assume that t is the number of years since 2000 and C is the cost in thousands of dollars.

	2000	01	02	03	04	05
Year, t	0	1	2	3	4	5
Operating costs, C	2.3	2.6	3.1	3.3	4.0	5.2
	.3	.5	.2	.7	1.2	

QuadReg
y=ax²+bx+c
a=.0946428571
b=.0667857143
c=2.382142857

9] Use the results from the regression shown to find the best-fitting quadratic model for the data. Round to **two** decimal places. Then use the model to find the operating cost in 2007. Show your work.

second diff: .2 .3 .5 .5 (7)

$y = .09x^2 + .07x + 2.38$

$.09(7)^2 + .07(7) + 2.38$ or use table

$= 7.28$ = \$7,280

A pumpkin tossing contest is held each year in Morton, Illinois, where people compete to see whose catapult will send pumpkins the farthest. One catapult launches pumpkins from 25 feet above the ground at a speed of 125 feet per second. The table shows the horizontal distances (in feet) the pumpkins travel when launched at different angles.

Angle (degrees)	20	30	40	50	60	70
Distance (feet)	372	462	509	501	437	323

QuadReg
y=ax²+bx+c
a=-.2614285714
b=22.59142857
c=23.02857143

10] Use the results from the regression shown to find the best-fitting quadratic model for the data. Round to **two** decimal places. Then use the model to determine at what angle the pumpkin travels the farthest. Show your work.

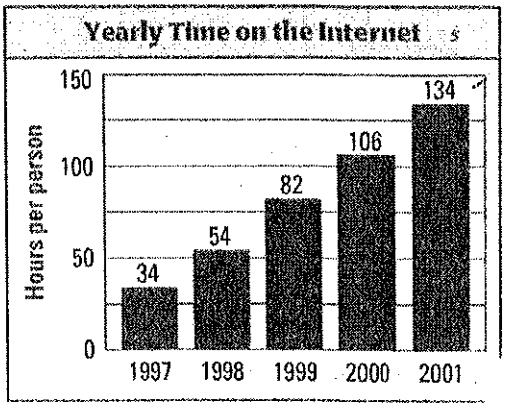
$y = -.26x^2 + 22.59 + 23.03$

At angle 43.

I put the equation into the calculator & looked at the table. OR find max: $-22.59/2(-.26)$

= 43.44

The bar graph shows the average number of hours per person per year spent on the Internet in the United States for the years 1997-2001. **Let x be the number of years SINCE 1997.**



11] Use a graphing calculator to find the best-fitting quadratic model for the data. Round to **two** decimal places.

Though more linear

$y = .86x^2 + 21.77x + 33.31$

12] Use your model to predict the average number of hours a person will spend on the Internet in 2010. Show your work.

$= .86(13)^2 + 21.77(13) + 33.31$

= 461.66

year	hrs
0	34
1	54
2	82
3	106
4	134