Name _____ Date _____ Pd _____

**2.4 Modeling Quadratic Functions using Regression CYU DAY ONE**

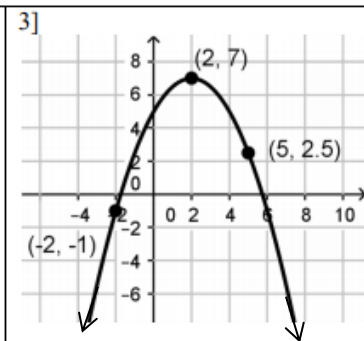| CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Writing Quadratic Equations from Graphs		1 - 3	
Writing Quadratic Equations from points on the calculator		4 - 6	5
Finite Differences		5, 6	

Write the quadratic function in standard form for each parabola graphed below and use it to find the missing information.

1] y =
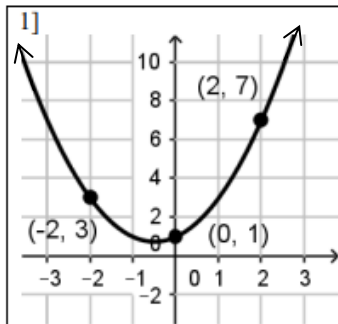
Find the coordinates of the vertex.
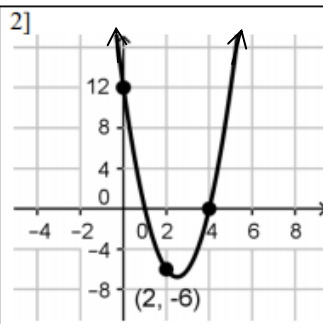
2] y =

(-2, _____) and (5, _____) are also on the graph.

3] y =

Find the coordinates of the y-int.

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

5] 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
Pop., P	22.8	25.0	26.5	27.1	27.8	28.1	27.9	26.9	26.1

a) Use the results from the regression shown to find the best-fitting quadratic model for the data. Round to the thousandths place.

```
QuadReg
y=ax²+bx+c
a=-.2133116883
b=2.08482684
c=22.96242424
```

b) Use the model from part (a) to predict the population in 2007. Show your work.

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

Year, t	0	1	3	5
Operating Costs, C	14.8	9.1	3.3	5.1

a) Write the best-fitting quadratic model for the data. Round to the thousandths place.

b) Use the model to find the lowest operating cost of the business from 2000 to 2005. Show your work.

7] 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

a) Use the results from the regression shown to find the best-fitting quadratic model for the data. Round to the thousandths.

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

b) Use the model to determine at what **angle** the pumpkin travels the farthest. Show your work.

CYU Reflection: *How far can you go: basic, intermediate, or advanced?*
Rate your mastery level!
How confident are you with the skills this CYU covered? Circle the score you would give yourself.

1 2	3 4 5	6 7 8
Basic	Intermediate	Advanced Solved ALL!