Quadratic Regression Equation Worksheet

7. Apply Mathematics (1)(A) A man throws a ball off the top of a building and records the height of the ball at different times, as shown in the table.

a. Find a quadratic model for the data.

b. Use the model to estimate the height of the ball at 2.5 seconds.

c. What is the ball's maximum height?

Height of a Ball

Time (s)	Height (ft)
0	46
1	63
2	48
3	1

8. Apply Mathematics (1)(A) The table shows the height of a column of water as it drains from its container. Use a quadratic model of this data to estimate the water level at 30 seconds.

Water Levels

Elapsed Time (s)	Water Level (mm)
0	120
20	83
40	50

9. a. Apply Mathematics (1)(A) Find a quadratic model for the data. Use 1981 as year 0.

Price of First-Class Stamp

Year	1981	1991	1995	1999	2001	2006	2007	2008
Price (cents)	18	29	32	33	34	39	41	42

SOURCE: United States Postal Service

b. Describe a reasonable domain and range for your model. (*Hint:* This is a discrete, real situation.)

c. Use a Problem-Solving Model (1)(B) Estimate when first-class postage was 37 cents.

d. Use your model to predict when first-class postage will be 50 cents. Explain why your prediction may not be valid.

10. Apply Mathematics (1)(A) The table and graph below give the stopping distances of an automobile for dry and wet road conditions.

Speed (mi/h)	0	20	30	40	50
Stopping Distance on Dry Roadway (ft)	0	40	75	120	175

a. Find a quadratic model for the stopping distance of an automobile for each type of road condition.

b. Use Representations to Communicate Mathematical Ideas (1)(E) Use your models to compare the stopping distance of an automobile traveling at 65 mph on dry and wet road conditions.
Estimate the difference in stopping distance on the wet and dry surfaces if a car is going at a speed of 45mph? 60mph?