Name _____

1. The number h (in thousands) of hairdressers and cosmetologists in the United States from 1994 to 2001 can be approximated by the model $h = 4.17t^2 - 49.1t + 881,\ 4 \le t \le 11$ where t represents the year, with $t = 4$ corresponding to 1994.
   a. Using this model, determine the year in which the number of hairdressers and cosmetologists was the least.
   b. According to this model, what was the least number of hairdressers and cosmetologists for this time period?

2. A manufacturer of lighting fixtures has daily production costs of $C = 800 - 10x + 0.25x^2$ where C is the total cost (in dollars) and x is the number of units produced. How many units must be produced each day to yield a minimum cost?

3. From 1960 to 2001, the average annual per capita consumption C of cigarettes by Americans (age 18 and older) can be modeled by $C = 4274 + 3.4t - 1.52t^2,\ 0 \le t \le 41$, where t is the year, with $t = 0$ corresponding to 1960.
   a. Sketch a graph of the model.
   b. Use the graph of the model to approximate the maximum average annual consumption. Begining in 1966, all cigarette packages were required by law to carry a health warning. Do you think the warning had any effect? Explain.
   c. In 2000, the US population (age 18 and over) was 209,128,000. Of these, about 48,300,000 were smokers. What was the average annual cigarette consumption *per smoker* in 2000? What was the average daily cigarette consumption *per smoker*?

4. The number y (in millions) of VCRs in use in the United States for the years 1994 through 2000 can be modeled by $y = -0.17t^2 + 4.3t + 60, 4 \leq t \leq 10$ where $t = 4$ corresponds to 1994.
   a. Sketch a graph of the model.

   b. Use this model to determine the year in which VCR use was the highest. How many VCRs were in use for that year according to the model?

   c. Do you think the model can be used to estimate VCR use in the year 2008? Explain.

Write the standard from of the quadratic function that has the given vertex and whose graph passes through the given point.

5. Vertex: $(-2, 5)$ Point: $(0,9)$

6. Vertex: $(4, -1)$ Point: $(2,3)$

7. Vertex: $(-1,4)$ Point: $(-3,0)$

8. Vertex: $(-2, -1)$ Point: $(0,3)$