Name: _____ Date: _____

Example A store sells 3000 Halloween wigs at $20 each, every month. For each $1 increase in price, they would sell 100 less wigs. What is the price that would maximize the store's revenue?

a. Make a function to model the situation.

b. Factor the function and find the zeros; what do the zeros represent?

c. Find the vertex of the function you made in part a). What does this represent?

Maximization Problems

Example In the (North American) football, a field goal can be scored by kicking the ball between the goal posts in the opponents end zone. For a kick in a particular game, the height of the ball above the ground, *y*, in metres, can be modelled by the function

$$y = -4.9x^2 + 25x$$

where *x* is the time in seconds after the ball left the foot of the player.

a. Determine the maximum height that this kick reached, to the nearest tenth of a metre.

b. State any restrictions that the context imposes on the domain and range of this function.

c. How long was the ball in the air?