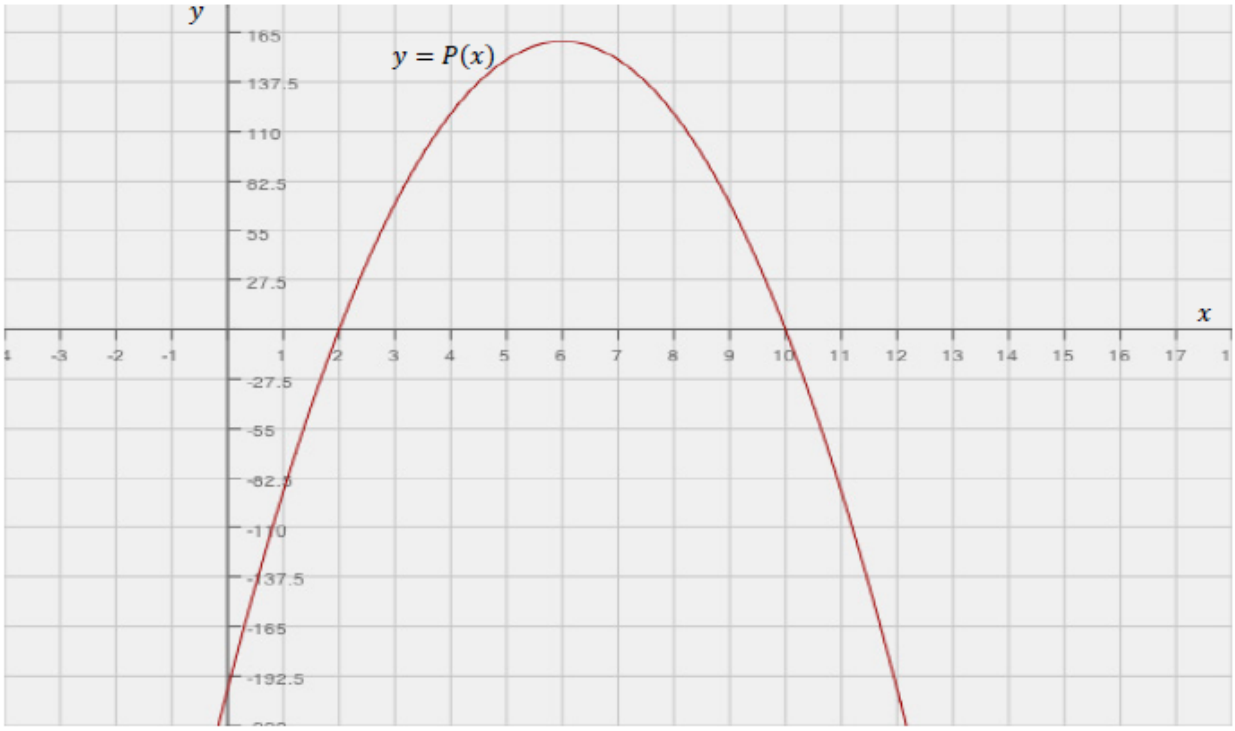
NAME_____DATE_____PERIOD_____

1.) A toy company is manufacturing a new toy and trying to decide the price that will result in a maximum profit. The graph below represents the profit (*P)*, generated by each price of a toy (*x*). Answer the questions based on the graph of the quadratic function model.



a. If the company wants to make a maximum profit, what should the price of a new toy be?

b. What is the minimum price of a toy that will produce profit for the company? Explain your answer.

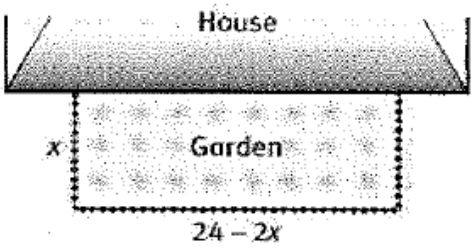
c. If the company wants to make a profit of $137, for how much should the toy be sold?

d. Find the domain that will only result in a profit for the company and find its corresponding range of profit.

e. The company owner believes that selling the toy at a higher price will result in a greater profit. Explain to the owner how selling the toy at a higher price will affect the profit.

NAME_____DATE_____PERIOD_____

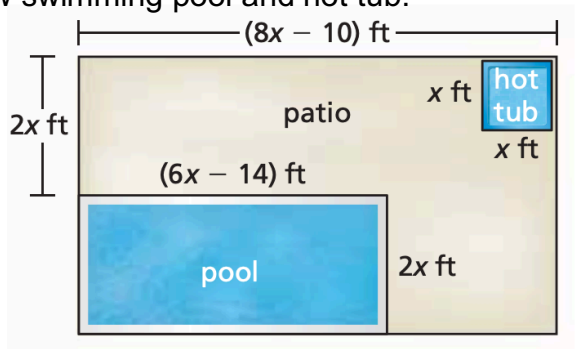
2.) Mr. Picasso would like to create a small garden adjacent to his house. He has 24 feet of fencing to put around the three sides of the garden. The function that describes the area in terms of the width of the garden is $A(x) = -2x^2 + 24x$.



What are the dimensions of the garden with the maximum area? Show your algebraic solution.

What is the maximum area of the garden?

3.) A hotel installs a new swimming pool and hot tub.



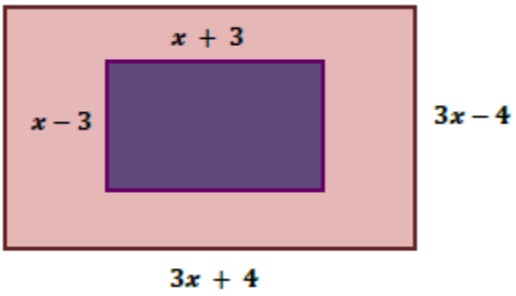
a. Find the area of the hot tub in terms of a polynomial.

b. Find the area of the pool in terms of a polynomial.

c. Write and simplify a polynomial for the area of the patio.

NAME_____DATE_____PERIOD_____

4.) In the accompanying diagram, the width of the inner rectangle is represented by $x - 3$ and its length by $x + 3$. The width of the outer rectangle is represented by $3x + 4$ and its length by $3x - 4$.



a. Write an expression to represent the area of the larger rectangle.

b. Write an expression to represent the area of the smaller rectangle.

c. Express the area of the pink shaded region as a polynomial in terms of x.