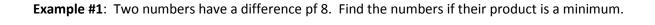
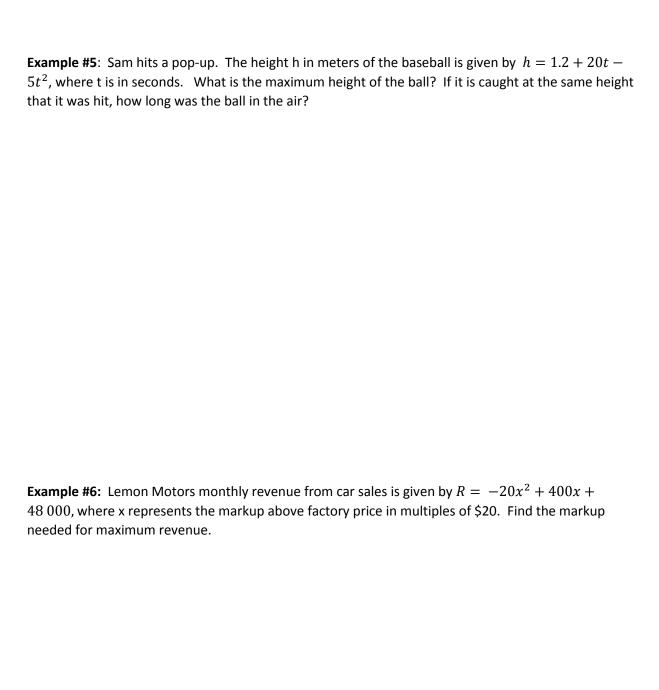
5.8: Maxima/Minima Problems from Standard Form

For many problems, it is desirable to find the largest or smallest outcome. For example, a manufacturer may want to know when the largest profit is obtained in a process or when the smallest amount of raw material is used. By setting the problems up using a quadratic function, the largest, or smallest value is found by completing the square and finding the vertex.



Example #2: The sum of a number and 3 times another number is 18. Find the number if the product is a maximum.





Practice Problems:

Demonstrate that the vertex obtained by completing the square and by factoring are identical. Round answers to 3 decimal places.

a)
$$2x^2 + 13x + 6$$

b)
$$6x^2 - 21x - 12$$

c)
$$-2x^2 - 7x - 3$$

d)
$$-4x^2 + 15x - 9$$

e)
$$2x^2 + 17x + 35$$