Conditions

The number of mosquitoes M(x), in millions, in a certain area depends on the June rainfall x, in inches: M(x) = 4x - x2. What rainfall produces the maximum number of mosquitoes?

Solution

We must find the maximum of this function. For this consider the derivative:

$$f'(x) = (4x - x^2)' = 4 - 2x$$

The point x=2 is a minimum of this function, and as the rainfall in inches can't be negative value, so x=0 is a maximum, 4-2*0 = 4 millions of mosquitoes.