Conditions

A certain culture initially contains 10000 bacteria and increases 20% every hour.
a) Find a formula for the number N(t) of bacteria present after t hours.
b) How many bacteria are in the culture at the end of 10 hours?

Solution

First off all we must say, that we are considering the case, when 20% is an addition to a total amount of bacteria in the end of previous hour. It means, that if after 1st hour there where 10000 + 10000*20% = 12 000 bacteria, then after 2nd hour there will be 12000 + 12000*20% = 14400 bacteria, and so on and so forth.

a)

$$N(t) = 10000(1 + 0.2)^t, \text{where } t \text{ is a passed time, in hours}$$

b)

$$N(10) = 10000(1.2)^{10} \approx 61917$$

61917 bacteria will be at the end of 10 hours.