Answer on Question #78436 – Math – Differential Equations

Question

One hundred grams of cane sugar in water are being converted into dextrose at a rate which is proportional to the amount unconverted. Find the differential equation expressing the rate of conversion after t minutes.

Solution

Let m be the amount (in grams) of sugar converted in time t (in minutes).
Then $(100 - m)$ is the amount (in grams) unconverted.
The rate of conversion is proportional to the amount unconverted

$$the\ rate\ of\ conversion = \frac{dm}{dt} = k(100 - m),$$

where k is the constant of proportionality.

Answer: $\frac{dm}{dt} = k(100 - m)$.