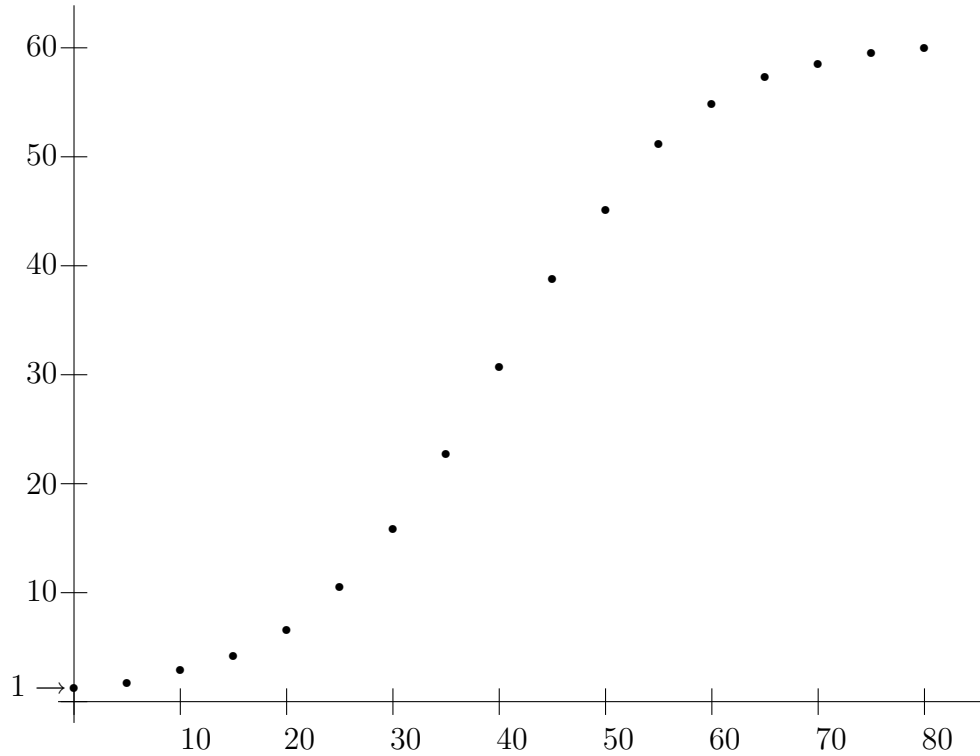


(1) The graph shows data for the growth of a population of bacteria which has a limit on its size; $y(t)$ is the amount of bacteria in grams at time t in days; $y(t)$ is assumed to satisfy the logistic equation.

$$y(t) = \frac{K}{1 + ce^{-rt}}$$



Using this data, estimate the values of K , c , and r .

(2) Solve the equation $\frac{dy}{dt} = 2y(1 - \frac{y}{50})$, with $y(0) = 10$.

(3) In the absence of predators, a population of rabbits grows exponentially and would double in 9 months. A pack of foxes eat rabbits at a rate of 7.7 rabbits per month. Initially there are 90 rabbits. Write a rate equation for the number $y(t)$ of rabbits at each time t .

(3b) Solve this differential equation to find the number of rabbits for all times t .

(3c) Do all rabbits get eaten, and if so, at what time?