

Differential Equation:

An increasing function f satisfies the differential equation $\frac{dy}{dx} = \frac{1}{25}(y - 300)$ with initial condition $f(0) = 1400$.

- a) Use the line tangent to the graph of $f(x)$ at $x = 0$ to approximate the value of $f(x)$ at $x = 1/4$.
- b) Find $\frac{d^2y}{dx^2}$ in terms of y . Use $\frac{d^2y}{dx^2}$ to determine whether your answer in part a is an underestimate or overestimate of $f\left(\frac{1}{4}\right)$.
- c) Find the particular solution $y = f(x)$ to the differential equation $\frac{dy}{dx} = \frac{1}{25}(y - 300)$ with initial condition $f(0) = 1400$.