

Exponential Growth & Decay

p. 499 - 503 (7.1)

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If y is a differentiable function of t such that $y > 0$ and $y' = ky$, for some constant k , then $y = Ce^{kt}$.

The constant of variation is called k and a direct variation is denoted by $y = kx$.

A proportion that varies inversely is $y = \frac{k}{x}$.

**1. If $\frac{dy}{dt} = ky$ and k is a nonzero constant, then y could be

(A) $2e^{kty}$ (B) $2e^{kt}$ (C) $e^{kt} + 3$ (D) $kty + 5$ (E)

$$\frac{1}{2}(k(y))^2 + \frac{1}{2}$$

**2. The number of bacteria in a culture is growing at a rate of $3000e^{2t/5}$ per unit of time t . At $t = 0$, the number of bacteria present was 7,500. Find the number present at $t = 5$.