

Growth and Decay

Exponential Growth and Decay

$$A = A_0 e^{kt}$$

If $k > 0$

If $k < 0$

Exponential Growth

Exponential Decay

\$25,000 at 4% compounded continuously

Doubling time

Population

203.3 million in 1970

300.9 million in 2007

When will it be 315 million?

Carbon Dating

After 5715 years amount of carbon present is half of what was there originally.

Logistic Growth Model

$$A = \frac{c}{1 + ae^{-bt}}$$

$$A = \frac{30,000}{1 + 20e^{-1.5t}}$$

Newton's Law of Cooling

$$T = C + (T_0 - C)e^{kt}$$

Cake is 210°F left to cool in a room that is 70°F. After 30 minutes the cake is 140°F.

Find k

Find T at 40 min

Find t at 90°