7.6 Solve Problems Involving Exponential Growth and Decay

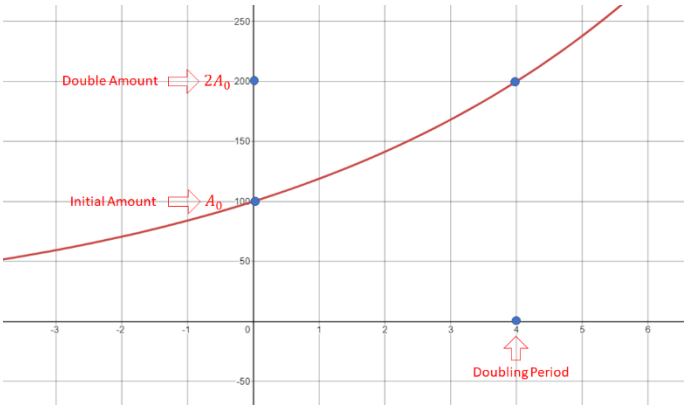
A Exponential Growth and Doubling Period

Exponential growth may be modelled by a formula

$$A = A_0 2^{\frac{t}{D}}$$

where

- ✓ 2 is the base
- ✓ D is called doubling period
- ✓ t is time
- ✓ A_0 is called the initial amount
- ✓ A is the amount at time t



Example 1.

B Exponential Growth and Rate of Change

Exponential growth may be modelled by a formula

$$A = A_0(1 + r)^t$$

where

- ✓ $1 + r$ is the base
- ✓ r is the growth (increasing) rate (usually per year, given as percentage)
- ✓ t is the tine (usually the number of years)
- ✓ A_0 is called the initial amount
- ✓ A is the amount at time t

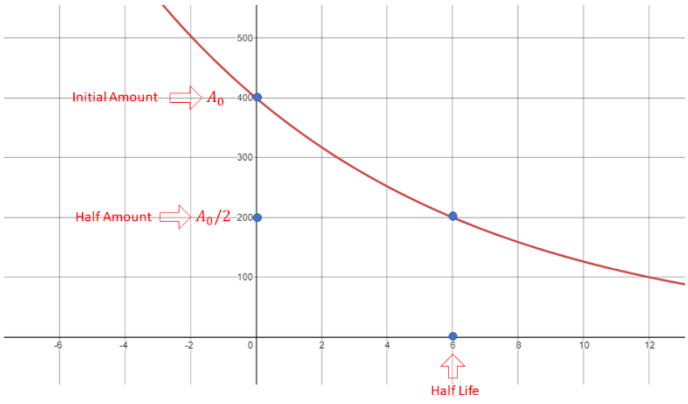
C Exponential Decay and Half Life

Exponential decay may be modelled by a formula

$$A = A_0 \left(\frac{1}{2}\right)^{\frac{t}{H}}$$

where

- ✓ $\frac{1}{2}$ is the base
- ✓ H is called half life
- ✓ t is time
- ✓ A_0 is called the initial amount
- ✓ A is the amount at time t



D Exponential Decay and Rate of Change

Exponential growth may be modelled by a formula

$$A = A_0(1 - r)^t$$

where

- ✓ $1 - r$ is the base
- ✓ r is the decay (decreasing) rate (usually per year, given as percentage)
- ✓ t is the tine (usually the number of years)
- ✓ A_0 is called the initial amount
- ✓ A is the amount at time t

Notes: Textbook Pages 395-401
Homework: Textbook Pages 401-405 # 1, 2, 6

