

Section 4.3 - Amortization and Sinking Funds

Sinking Fund

Is a fund accumulated over time in order to pay off a debt or meet future goals or obligations.

The periodic payment E required to accumulate a sum of F dollars over n periods with interest charged at the rate of i per period is

$$E = \frac{Fi}{(1+i)^n - 1}$$

Amortization

Is the process of paying off a debt with equal periodic payments made over a specified period of time that includes a portion of the principal and interest.

The periodic payment E on a loan of P dollars to be amortized over n periods with interest charged at the rate of i per period is

$$E = \frac{Pi}{1 - (1+i)^{-n}}$$

Example 1: Kelly wishes to buy a car that costs \$32,998. The car dealer tells her that they can finance the car at 6.25% per year compounded monthly for 5 years. She decides to secure the loan from the dealer. How much will her monthly payments be?

Example 2: A person would like to have \$200,000 in an account for retirement 15 years from now. How much should be deposited quarterly in an account paying 6% per year compounded quarterly to obtain this amount?

Example 3: A sailboat costs \$16,000. You pay 15% down and secure a loan for the remaining balance. How much are your monthly payments if 18% per year compounded monthly is charged over a period of 6 years?

Example 4: Christina plans to go to Disney World in two summers and wishes to have \$7000 by then. How much money should she deposit monthly for the next 2 years in an account paying 3.25% per year compounded monthly to achieve this goal?

Example 5: Business partners, Bill and Bob, buy an apartment house for \$1,250,000 by making a down payment of \$125,000 and financing the rest with semiannual payments over the next 10 years. The interest rate on the debt is 8% per year compounded semiannually. How much is their semiannually payment?