

Math 1313  
Chapter 5 – Section 5.3  
Amortizations and Sinking Funds

## Amortizations

To **Amortize** is to liquidate, for example, a debt by installment payments.

### Amortization Formula:

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

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

### Sinking Fund

A **Sinking Fund** is a fund that is set up for a specific purpose at some future date.

### Sinking Fund Formula:

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

$$R = \frac{iS}{(1 + i)^n - 1}$$

Example 1: Carrie just graduated from college and got her first real job. Her aunt loaned her \$15,000 over the past 4 years for her tuition and books. Carrie now needs to pay her aunt back. Her aunt will charge her 3% per year compounded monthly. How much will Carrie's monthly payments be if she wishes to owe her aunt nothing in 4 years?

Example 2: Ted plans to retire in 30 years and decides to start saving for his retirement now. He wishes to have \$500,000 when he retires. The account he's decided to invest in pays 8% per year compounded semiannually. How much must he invest semiannually to achieve his goal?

Example 3: A local pizza delivery restaurant anticipates that it will need a new delivery car in 3 years. The car they are interested in buying costs \$10,000. How much should the pizza place invest each quarter over the next 3 years in an account that pays 3% per year compounded quarterly, to buy this new car when they anticipate needing it?

Example 4: A bedroom set costs \$3,000. You pay 5% 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 2 years?