

Teacher: Mrs. RoenUnit: Annuities and MortgagesCourse: MAP 4CLesson: 6 – 1 Simple and Compound Interest◆ **Homework Check:** none◆ **Note:** Simple and Compound Interest

Simple interest is the interest earned on the principal while compound interest is interest earned on both the principal and the accumulating interest. The formulas are also very different. The simple interest formula is only a multiplying formula while the compound interest formula is an exponential formula. The formulas you are already familiar with from last year are as follows:

Simple Interest FormulasInterest only: $I = Prt$ Amount and interest together: $A = P(1 + rt)$ **Compound Interest Formulas**Amount: $A = P(1 + i)^n$ Principal (or present value): $P = A(1 + i)^{-n}$

**Remember when working with interest and compounding periods:

annually is one time per year

semi-annually is two times per year

quarterly is four times per year

monthly is twelve times per year

daily is 365 times per year

Whenever working in this unit, first find which type of interest you are working with, discover whether you are looking for interest and/or principal, then finally discover whether you are looking for the values today or in the future. These things will have direct effects on which formulas you use! For example,

1. Find the amount of a \$2500 loan taken out over 3 years

a) under 7% simple interest

$$A = P(1 + rt)$$

$$A = 2500(1 + .07(3))$$

$$A = 2500(1 + 0.21)$$

$$A = 2500(1.21)$$

$$A = \$3025$$

b) under 5% interest compounded semi-annually

$$\frac{0.05}{2} = 0.025$$

$$n = 2(3) = 6$$

$$A = P(1 + i)^n$$

$$A = 2500(1 + 0.025)^6$$

$$A = 2500(1.025)^6$$

$$A = \$2899.23$$

2. Find the amount needed to be invested today in order to have \$3000 in 5 years at 6% compounded quarterly.

$$\frac{0.06}{4} = 0.015$$

$$n = 4(5) = 20$$

$$P = A(1+i)^{-n}$$

$$P = 3000(1+0.015)^{-20}$$

$$P = 3000(1.015)^{-20}$$

$$P = \$2227.41$$

◆ **Homework:** FCM 11 handout p. 454 # 1 - 8

Unit 6: Lesson 6 – 1

1. Show the growth of a \$2000 investment at both 5% per year simple interest and 5% per year, compounded annually. Complete the table given.

Year	Simple Interest 5%	Compound Interest 5% compounded annually
1		
2		
3		
4		
5		
6		

2. Compare the amounts after 4 years for a \$1500 investment.

Year	3% compounded annually	3.5% compounded annually	4% compounded annually
1			
2			
3			
4			

3. Find the amount for each.

a) \$600 invested at 7% per year, compounded annually, for 3 years

b) \$4000 loan at 9% per year, compounded monthly, for 3 years

c) \$1200 invested at 4.5% per year, compounded quarterly, for 2 years

- 4. Bill makes 2 investments: \$5000 at 5.5% per year, compounded quarterly, for 4 years, and another of \$2500 at 5.8% per year, compounded semi-annually, for 4 years.**
- a) Which investment earns the most interest?
- b) What is the total interest earned on his investments?
- 5. Barbara borrows \$2300 at 10% per year, compounded quarterly.**
- a) How much must she repay after 5 years?
- b) How much of the amount she repays is interest?
- 6. Neville wants to invest enough money so his son will have \$4800 to cover expenses for school. If the annual interest rate is 5.7% per year, compounded monthly, how much needs to be invested today?**
- 7. Suppose you owe a sum of \$10 000 due in 6 years. Your creditor is willing to accept early payment of the loan by discounting it at 9.6% per year, compounded monthly. How much should your creditor be willing to accept today?**