

Teacher: Mrs. RoenUnit: Annuities and MortgagesCourse: MAP 4CLesson: 6 – 2 Amount of an Annuity◆ **Homework Check:** Lesson 6 - 1◆ **Note:** Amount of an Annuity

An annuity is a series of equal payments made at regular time intervals. In most regular simple annuities, payments are made at the end of each compounding period. The amount of an annuity is the sum of the regular payment deposits plus interest. The formula for the amount of a regular annuity is:

$$A = \frac{R[(1+i)^n - 1]}{i}$$

where A is the amount in dollars owed, R is the regular payment in dollars, i is the interest rate per compounding period as a decimal and n is the number of compounding periods. The only new variable we are introduced to in this formula is the R. The other variables are used in the exact same way as they were in the compound interest formulas. For example,

Suppose Cory invests \$50 at the end of each month for 2 years. The interest is 12% compounded monthly. How much interest will Cory make?

$$\frac{0.12}{12} = 0.01$$

$$n = 12(2) = 24$$

$$A = \frac{R[(1+i)^n - 1]}{i}$$

$$A = \frac{50[(1+0.01)^{24} - 1]}{0.01}$$

$$A = \frac{50[(1.01)^{24} - 1]}{0.01}$$

$$A = \$1348.67$$

So the amount in the account is now \$1348.67, but how much did Cory actually put in himself?

$$24(50) = \$1200$$

Cory actually put \$1200 into the investment himself. So, how much is interest he earned?

$$1348.67 - 1200 = \$148.67$$

Cory earned \$148.67 interest.

◆ **Homework:** Lesson 6 – 2

Lesson 6 – 2

1. Calculate the amount for each of the following using the formula: $A = \frac{R[(1+i)^n - 1]}{i}$

a) $R = \$200, i = 0.05, n = 3$

b) $R = \$1000, i = 0.08, n = 7$

2. Determine the amount of each ordinary simple annuity.

a) \$3000 deposited every year for 10 years at 7% per year compounded monthly

b) \$650 deposited every 6 months for 8 years at 9% per year compounded semi-annually

c) \$1450 deposited every quarter for 9 years at 6.25% per year compounded quarterly

d) \$375 deposited every month for 6 years at 5.9% per year compounded monthly

3. Determine the amount of interest earned on each investment in question #3.

a)

b)

c)

d)

4. **Shane wants to save \$10 000 for his first year of college. He deposits \$300 at the end of each month in an account that earns 5.6% per year compounded monthly. Will Shane have enough money saved at the end of 2.5 years?**
5. **Gabby's parents saved for her college education by depositing \$1200 each year in an RESP that earns 6% per year compounded annually.**
- a) **How much in in the RESP after 18 years?**
- b) **How much interest is earned?**
- c) **How much extra interest would have been earned if the interest rate was 7%?**
6. **Vera is saving for a new desktop computer. She deposits \$100 each month at 4% per year compounded monthly.**
- a) **Determine the amount saved after 3 years.**
- b) **What happens to the amount if the time of the savings is changed to 6 years?**