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**The Amount of an Annuity (FV)**

***Goal: Calculate the amount (future value) of a simple ordinary annuity***

***Calculate the present value of a simple ordinary annuity***

* An ***annuity*** is a series of ***equal*** payments paid ***in to our out of*** an account at ***regular*** intervals

**Compound Periods *(# times per year)***

Annually: Semi-Annually:

Monthly: Semi-Monthly:

Weekly: Bi-weekly:

Quarterly: Daily:

* In an ***ordinary simple annuity***, payments are made at the ***end*** of each ***compounding*** period
* The ***AMOUNT*** of an annuity (***future value***) is the sum of regular deposits plus ***interest***

The ***AMOUNT*** of an ordinary simple annuity is given by the formula , where

***A = i =***

***R = n =***

This formula can only be used when the ***payment interval is the same as the compounding period***

***Example*** Suppose $450 were deposited at the end of each quarter for 1.5 years into an annuity that earns 10% per year compounded quarterly

1. What is the amount of the annuity?

***A = ?***

***R =***

***i =***

***n =***

The ***INTEREST*** of an ordinary simple annuity is given by the formula , where ***I*** is interest amount

1. How much interest did the annuity earn?

Example 1:

Jane invests $500 at the end of each year for 4 years. If interest is paid at 7%/a compounded

annually, how much will the investment be worth immediately after the last deposit is made?

What is the total interest earned?

Example 2:

Determine the future value of quarterly deposits of $1000 over 10 years at 5½%/a compounded quarterly.

Example 3:

How much must be deposited each month at 6%/a compounded monthly for 3 years in order to have $10 000 on the day of the last deposit?

Example 4:

a) Laars deposits $2000 each quarter year for 6½ years. If interest is at 5.5% Cq, how much will be in his account after the last deposit is made?

b) How much interest has his money earned in total?

**Annuities Practice**

1. a) How much must Hallie deposit each month in a savings account paying 3%/a Cm in order to have $20 000 after 5¾ years?

b) How much interest did her investment earn?

2. Once every 3 months, James deposits $100 into a savings account paying 4%/a Cq. How much will he have after 51 months?

3. Aziz invests $1200 each year in an account paying 6%/a Ca while Chee-Mei invests $100 per month into an account paying 5.88%/a Cm. Who has more after 10 years and how much more do they have?

1. Harry’s parents saved for his college education by depositing $1200 at the end of every 6 months

since birth in a *Registered Education Savings Plan* (RESP) that earns 5%/a compounded

semi-annually.

1. What is the amount of the RESP at the end of 18 years?
2. How much interest is earned?
3. How much extra interest would have been earned if the interest rate was 7% per year compounded semi-annually?

**Homework**: p. 511 #5 (draw timeline for b), 6-9