**The Present Value of an Annuity**

The ***present value*** of an annuity is the ***principal*** that must be invested ***TODAY*** to provide regular payments in the future.

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

***PV = i =***

***R = n =***

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

***Example 1 – Providing for an Annuity***

Victor wants to withdraw $700 at the end of each month for 8 months, starting 1 month from now. His bank account earns 5.4% per year compounded monthly.

1. How much must Victor deposit in his account TODAY to pay for the withdrawals?

***Type:***

***PV = ?***

***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 2 – Calculating the Amount Needed at Retirement***

Azad plans to retire at age 60. He would like to have enough money saved in his retirement account so he can withdraw $7500 every 3 months for 25 years, starting 3 months after he retires. How much must Azad deposit at retirement at 9% per year compounded quarterly to provide for the annuity?

***Example 3 – Calculating the Principal Borrowed for a Loan***

Valeria plans to buy a used car. She can afford monthly car loan payments of $300. The car dealer offers Valeria a loan at 6.9% per year compounded monthly, for 3 years. The first payment will be made 1 month from the date she buys the car.

a) How much can Valeria afford to borrow?

b) How much interest will Valeria pay on the loan?

**PRACTICE**

1. How much do you need to invest now at an ordinary simple annuity so that you can receive payments of $240 every month for 15 years at 2.25% per year compounded monthly?

2) Determine the present value and amount of interest annuity earned of the following ordinary simple annuity:

Quarterly payments of $50 for 4.5 years at 4.8% per year compounded quarterly

3) Mikayla is setting up an income fund for her retirement. She wishes to receive $2500 every month for the next 20 years, starting 1 month from now. The income fund pays 4% per year compounded monthly. How much must Mikayla deposit now to be able to receive the desired amount every month?