SECTION 5.2 – Compound Interest

Simple Interest is used for loans or investments of a year or less. For longer periods, compound interest is used.

Compound Interest Formula: $A = P(1+i)^n$ where $i = \frac{r}{m}$ and $n = mt$

r is rate and m is number of compounding periods per year

Example 1:

Find the compound amount for an investment of $15,000 at 6% compounded semiannually for 11 years.

Example 2:

Find the amount of interest earned on $5124.98 at 6.3% compounded quarterly for 5.2 years.

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Effective Rate of Interest:

Because of compounding, the actual interest rate varies slightly from the stated (nominal) interest rate. The actual interest rate is referred to as the effective rate of interest. The effective rate is called the APR (annual percentage rate) in consumer finance.

Effective Rate Formula: $r_E = \left(1 + \frac{r}{m}\right)^m - 1$

Example 3:

Find the effective rate corresponding to a nominal interest rate of 12% compounded semiannually.

Present Value for Compound Interest: $P = \frac{A}{(1+i)^n}$ or $P = A(1+i)^{-n}$

Example 4:

Find the present value for the future amount of $17,230 at 4% compounded quarterly for 10 years.