

Lesson 7-6 – Compound Interest – Differing Periods

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2. Different Compounding and Payment Periods

- These are called 'general annuities'.
- When compounding interest periods and payment periods differ, an adjustment is required in order to utilize the formulas.
- This is usually done by:
 1. Computing the equivalent payment amounts for each compounding period and applying the interest rate
 2. Computing an effective interest rate for the payment periods

2. Different Compounding and Payment Periods Continued...

- Convert the nominal interest rate to the equivalent rate for the payment period.

p = number of payment periods per year

c = number of compounding periods per year

$$(1 + i_{eq})^p = (1 + i)^c$$

$$i_{eq} = (1 + i)^{c/p} - 1$$

$$P = A \left[\frac{(1 + i_{eq})^n - 1}{i_{eq} (1 + i_{eq})^n} \right] \quad F = A \left[\frac{(1 + i_{eq})^n - 1}{i_{eq}} \right]$$

General Annuities Example

- You arrange a mortgage loan for \$295,000 that requires monthly payments for 25 years at an interest rate of 5.35% compounded semi-annually. Find the amount of the monthly payment.

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$$(1 + i_{mo}) = \left(1 + \frac{0.0535}{2}\right)^{\frac{2}{12}} = 1.004409439$$

$$\$295000 = A \left[\frac{(1.004409)^{300} - 1}{0.004409(1.004409)^{300}} \right]$$

$$A = \$1774.89$$