SECTION 5.4 – Present Value of an Annuity and Amortization

Present Value of an Annuity – the amount that would have to be deposited in one lump sum today (at the same compound interest rate) in order to produce exactly the same balance as the periodic payments made over the same time period.

$$P = R\left[\frac{1-(1+i)^{-n}}{i}\right]$$ where R is the periodic payment

Example 1:

Payments of $15,806 quarterly for 3 years at 10.8% compounded quarterly. Find the present value of this ordinary annuity.

Amortization – a loan is amortized if both the principal and interest are paid by a sequence of equal periodic payments.

Amortization Payments Formula: $$R = \frac{Pi}{1-(1+i)^{-n}}$$

Example 2:

Find the monthly house payment necessary to amortize a loan of $149,560 at 7.75% for 25 years.

Find the amount of interest paid over the life of the loan.

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Prepare an Amortization Schedule for this loan.

First 5 Payments:

Payment #	Amount of Payment	Paid on Interest	Paid on Principal	Balance
0				$149,560
1				
2				
3				
4				
5				

Last 5 Payments:

Payment #	Amount of Payment	Paid on Interest	Paid on Principal	Balance
296	$1129.67	$35.78	$1093.89	$4446.65
297	$1129.67	$28.72	$1100.95	$3345.70
298	$1129.67	$21.61	$1108.06	$2237.64
299	$1129.67	$14.45	$1115.22	$1122.42
300	$1129.67	$7.25	$1122.42	$0