Time Value of Money (TVM) Master Formulas Cheat Sheet

Single Sums, Ordinary Annuities, Annuities Due, Perpetuities & Compounding Frequency Adjustments

1. THE 6 ESSENTIAL TIME VALUE OF MONEY FORMULAS

Cash Flow Pattern	Present Value (PV) Formula	Future Value (FV) Formula
Single Lump Sum	**PV = FV / (1 + r)^n = FV × (1 + r)^(-n)**	**FV = PV × (1 + r)^n**
Ordinary Annuity (Payments at END of period)	**PVA = PMT × [(1 - (1 + r)^(-n)) / r]**	**FVA = PMT × [((1 + r)^n - 1) / r]**
Annuity Due (Payments at BEGINNING of period)	**PV_due = PVA_ordinary × (1 + r)**	**FV_due = FVA_ordinary × (1 + r)**
Perpetuity (Infinite Stream)	**PV = PMT / r** (e.g., preferred stock)	N/A (infinite horizon)
Growing Perpetuity	**PV = PMT_1 / (r - g)** (Gordon Growth Model)	N/A (assuming r > g)

2. COMPOUNDING FREQUENCY CONVERSIONS & EFFECTIVE ANNUAL RATE (EAR)

Adjustment Dimension	Formula & Mathematical Definition	Practical Example (12% Stated Rate)
Periodic Rate (i) & Total Periods (N)	For compounding **m** times per year: • Periodic Rate: **i = r / m** • Total Compounding Periods: **N = n × m**	Monthly compounding for 5 years @ 12% APR: i = 12% / 12 = **1% per month** N = 5 × 12 = **60 periods**.
Effective Annual Rate (EAR)	**EAR = [1 + (r / m)]^m - 1** Continuous Compounding: **EAR = e^r - 1**	12% compounded monthly: EAR = (1 + 0.01)^12 - 1 = **12.68%** Always evaluate debt borrowing costs using EAR!