Important Loan Formulas PDF

Formulas
Examples
with Units

List of 7
Important Loan Formulas

1) EMI Formula

Evaluate Formula

Formula

$$EMI = LA \cdot R \cdot \left(\frac{(1+R)^{CP}}{(1+R)^{CP} - 1} \right)$$

Example

$$4770.4551 = 20000 \cdot .2 \cdot \left(\frac{(1+.2)^{10}}{(1+.2)^{10} - 1} \right)$$

2) EMI of Car Loan Formula

Evaluate Formula

Formula

$$MP_{loan} = P_{CL} \cdot \left(\frac{R}{12 \cdot 100} \right) \cdot \frac{\left(1 + \left(\frac{R}{12 \cdot 100} \right)\right)^{n_m}}{\left(1 + \left(\frac{R}{12 \cdot 100} \right)\right)^{n_m} - 1}$$

Example

$$16730.6336 = 750000 \cdot \left(\frac{.2}{12 \cdot 100} \right) \cdot \frac{\left(1 + \left(\frac{.2}{12 \cdot 100} \right)\right)^{45}}{\left(1 + \left(\frac{.2}{12 \cdot 100} \right)\right)^{45} - 1}$$

3) Loan Amount Formula

Evaluate Formula

Formula

$$LA = \left(\frac{PMT}{R} \right) \cdot \left(1 - \left(\frac{1}{(1+R)^{CP}} \right) \right)$$

Example

$$19704.6188 = \left(\frac{4700}{.2} \right) \cdot \left(1 - \left(\frac{1}{(1+.2)^{10}} \right) \right)$$

4) Remaining Loan Balance Formula

Evaluate Formula

Formula

$$FV_L = PV_L \cdot \left(1 + r_p\right)^{n_{PYr}} - TP \cdot \left(\frac{\left(1 + r_p\right)^{n_{PYr}} - 1}{r_p}\right)$$

Example

$$806400 = 10000 \cdot \left(1 + 2\right)^{4} - 90 \cdot \left(\frac{\left(1 + 2\right)^{4} - 1}{2}\right)$$

5) Loan Repayment Formulas

5.1) Loan Amortization Formula

Evaluate Formula

Formula

$$p = \frac{roi \cdot P}{MP_{Year} \cdot \left(1 - \left(1 + \frac{roi}{MP_{Year}}\right)^{-MP_{Year} \cdot T}\right)}$$

Example

$$32267.1872 = \frac{0.1 \cdot 1000000}{12 \cdot \left(1 - \left(1 + \frac{0.1}{12}\right)^{-12 \cdot 3}\right)}$$

5.2) Monthly Payment Formula

Evaluate Formula

Formula

$$p = LA \cdot \left(\frac{R \cdot \left(1 + R\right)^{CP}}{\left(1 + R\right)^{CP} - 1}\right)$$

Example

$$4770.4551 = 20000 \cdot \left(\frac{.2 \cdot \left(1 + .2\right)^{10}}{\left(1 + .2\right)^{10} - 1}\right)$$

5.3) Number of Months Formula

Evaluate Formula

Formula

$$n = \log10\frac{\frac{p}{R}}{\log10}\left(1 + R\right)$$

Example

$$0.8455 = \log10\frac{\frac{28000}{.2}}{\log10}\left(1 + .2\right)$$

Variables used in list of Loan Formulas above

- **CP** Compounding Periods
- **EMI** Equated Monthly Installment
- **FV_L** Future Value of Loan Amount
- **LA** Loan Amount
- **MP_{loan}** Monthly Payment of Car Loan
- **MP_{Year}** Monthly Payments in Year
- **n** Number of Months
- **n_m** Months
- **n_{PYr}** Number of Payments Per Year
- **p** Monthly Payment
- **P** Principal Loan Amount
- **P_{CL}** Principal Car Loan Amount
- **PMT** Annuity Payment
- **PV_L** Loan Principal
- **R** Interest Rate
- **r_p** Rate per Payment
- **roi** Rate of Interest
- **T** Time in terms of year
- **TP** Total Payments

Constants, Functions, Measurements used in list of Loan Formulas above

- Functions: **log10**, log10(Number)
  The common logarithm, also known as the base-10 logarithm or the decimal logarithm, is a mathematical function that is the inverse of the exponential function.

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