

Matt 109 – Formulas

$$\text{mean} = \frac{\text{sum of values}}{\text{number of values}}$$

Trade Discount: $T = RL$

Total amount of a series of discounts = Single Discount Equivalent x List Price

Net amount you pay after a series of discounts = Net Discount Equivalent x List Price

Cash Discount = Cash Discount Rate x Net Price

Net Amount = Complement of Cash Discount Rate x Net Price = Net Price – Cash Discount

$$\text{Amount credited} = \frac{\text{partial payment}}{\text{complement of cash discount rate}}$$

Outstanding Balance = Net Price – Amount Credited

Selling Price: $S = C + M$

Markup = Rate of Markup x Cost or Markup = Rate of Markup x Selling Price

$$\text{Markup Based on Cost: } M\%_{\text{cost}} = \frac{M\%_{\text{selling}}}{100\% - M\%_{\text{selling}}} (100\%)$$

$$\text{Markup Based on Selling: } M\%_{\text{selling}} = \frac{M\%_{\text{cost}}}{100\% - M\%_{\text{cost}}} (100\%)$$

Markdown = Original Selling Price – Reduced Price, or $M = S - N$

$$\text{Rate of Markdown} = \frac{\text{amount of markdown}}{\text{original selling price}} \text{ or } M\% = \frac{M}{S} (100\%)$$

Simple Interest: $I = PRT$

Maturity Value: $MV = P + I$

$$\text{Effective Interest Rate: } R = \frac{I}{PT}$$

$$\text{Period of Interest Rate} = \frac{\text{Annual Interest Rate}}{\text{Number of Interest Periods Per Year}}$$

$$\text{Future Value (Compound Interest): } FV = P \left(1 + \frac{r}{n}\right)^{nt}$$

Compound Interest: $I = FV - P$

$$\begin{aligned} \text{Present Value:} \quad & \text{For one year: } PV = \frac{FV}{1+r} \\ & \text{For } t \text{ years: } PV = \frac{FV}{\left(1 + \frac{r}{n}\right)^{nt}} \end{aligned}$$

Future Value (Annuity):

$$\begin{aligned} FV_{\text{ordinary annuity}} &= PMT \left(\frac{\left(1 + \frac{r}{n}\right)^{nt} - 1}{\frac{r}{n}} \right) \\ FV_{\text{annuity due}} &= PMT \left(\frac{\left(1 + \frac{r}{n}\right)^{nt} - 1}{\frac{r}{n}} \right) \left(1 + \frac{r}{n}\right) \end{aligned}$$

Sinking Fund:

$$\begin{aligned} PMT_{\text{ordinary annuity}} &= FV \left(\frac{\frac{r}{n}}{\left(1 + \frac{r}{n}\right)^{nt} - 1} \right) \\ PV_{\text{ordinary annuity}} &= PMT \left(\frac{\left(1 + \frac{r}{n}\right)^{nt} - 1}{\frac{r}{n} \left(1 + \frac{r}{n}\right)^{nt}} \right) \end{aligned}$$

$$\text{Monthly Mortgage Payment using chart: } \frac{\text{amount financed}}{\$1,000} \times \text{table value}$$

Monthly Mortgage Payment: $M = P \left(\frac{\frac{r}{n}}{1 - \left(1 + \frac{r}{n}\right)^{-n}} \right)$

Total Interest on Mortgage = Number of Payments x Amount of Payment – Amount Financed

Qualifying Ratios:

Loan-to-Value Ratio (LTV): $LTV = \frac{\text{amount mortgaged}}{\text{appraised value of property}}$

Housing Ratio or Front-End Ratio: $\frac{\text{total mortgage payment (PITI)}}{\text{gross monthly income}}$

Debt-to-Income Ratio (DTI): $DTI = \frac{\text{total fixed monthly expenses}}{\text{gross monthly income}}$

Current Yield of Stock: $\frac{\text{annual dividend per share}}{\text{closing price per share}} \times 100\%$

Trailing Earnings: P/E ratio = $\frac{\text{current price per share}}{\text{net income per share (past 12 months)}}$