

Finance Formulas

Simple Interest Formulas (for add-on interest)	
$FV = P(1 + rt)$ $\text{Interest Earned} = FV - P$ $\text{Interest Paid} = \text{total paid} - P$	FV = future value or maturity value P = present value or principal (lump sum) r = annual interest rate in decimal form t = time in years

Compound Interest Formulas	
$FV = P\left(1 + \frac{r}{n}\right)^{nt}$ $\text{Interest Earned} = FV - P$	n = number of periods in one year

Annual Yield Formulas	
$ay = \left(1 + \frac{r}{n}\right)^{nt} - 1$	Annual Yield for 1 year (t is always 1) ay = annual yield

Ordinary Annuity Formulas (for sinking funds, IRA, TDA)	
$FV(\text{ordinary}) = \text{pymt} \frac{\left(1 + \frac{r}{n}\right)^{nt} - 1}{\left(\frac{r}{n}\right)}$ $\text{Interest Earned} = FV - (\text{pymt} * nt)$	pymt = payment size
$\text{pymt} \frac{\left(1 + \frac{r}{n}\right)^{nt} - 1}{\left(\frac{r}{n}\right)} = P\left(1 + \frac{r}{n}\right)^{nt}$	P = present value of the annuity

Simple Interest Amortized Loan Formulas (for mortgage loans)	
$\text{pymt} \frac{\left(1 + \frac{r}{n}\right)^{nt} - 1}{\left(\frac{r}{n}\right)} = P\left(1 + \frac{r}{n}\right)^{nt}$ $\text{Interest Paid} = (\text{pymt} * nt) - P$ $\text{unpaid balance} = P\left(1 + \frac{r}{n}\right)^{nT} - \text{pymt} \frac{\left(1 + \frac{r}{n}\right)^{nT} - 1}{\left(\frac{r}{n}\right)}$	P = present value or loan amount T = number of years that have been paid