Formulas that will be provided in the midterm exam

FV of ordinary annuity (First payment starts one period from the beginning): $FV = PMT \frac{(1+r)^t - 1}{r}$

PV of ordinary annuity (First payment starts one period from the beginning): $PV = PMT \frac{1-(1+r)^{-t}}{r}$

FV of annuity due (First payment starts at the beginning): $FV = PMT \frac{(1+r)^t - 1}{r}(1 + r)$

PV of annuity due (First payment starts at the beginning): $PV = PMT \frac{1-(1+r)^{-t}}{r}(1 + r)$

PV of a level perpetuity: $PV = \frac{PMT}{r}$

PV of a growth perpetuity: $PV = \frac{PMT}{r-g}$

Sum of a geometric sequence: : $s = a_1 + a_1 * q + a_1 * q^2 + \cdots + a_1 * q^{n-1} = a_1 * \frac{1-q^n}{1-q}$

Risk of a portfolio: $\sigma_P = \sqrt{\sum_i w_i^2 \sigma_i^2 + \sum_{i \neq j} \rho_{i,j} \sigma_i \sigma_j w_i w_j}$