Quantitative Skills & Reasoning — Important Formulas & Facts

Linear Functions & Relations

Slope-intercept form $y = f(x) = mx + b$

Standard form $Ax + By = C$

Point-slope form $y - y_1 = m(x - x_1)$

Slope formula: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Compound Interest Formulas:

$$A = P\left(1 + \frac{r}{n}\right)^{n \cdot t}$$

$$APY = (1 + \tfrac{r}{n})^n - 1$$

Continuous Compounding

$$A = Pe^{rt}$$

$$APY = e^r - 1$$

A = accumulated amount, P = Principle, r = annual interest rate, t = number of years, n = frequency of compounding per year.

Savings Plan: $A = PMT\dfrac{\left[\left(1 + \dfrac{APR}{n}\right)^{n \cdot Y} - 1\right]}{\left(\dfrac{APR}{n}\right)}$ $\qquad PMT = \dfrac{A \times \left(\dfrac{APR}{n}\right)}{\left(1 + \dfrac{APR}{n}\right)^{n \cdot Y} - 1}$

A = accumulated amount, PMT = regular payment, APR = annual percentage rate, n = number of annual payments, Y = number of years

Total return = $\dfrac{(A - P)}{P} \times 100\%$ $\qquad$ Annual return = $\left(\dfrac{A}{P}\right)^{1/Y} - 1$

Laws of Exponents

$a^s \cdot a^t = a^{s+t}$ $\qquad \dfrac{a^s}{a^t} = a^{s-t}$ $\qquad (a^s)^t = a^{s \cdot t}$ $\qquad (ab)^s = a^s \cdot b^s$

$1^s = 1$ $\qquad a^{-s} = \dfrac{1}{a^s} = \left(\dfrac{1}{a}\right)^s$ $\qquad a^0 = 1$

Do your best!
Rise to the challenge!
Live and learn!

Properties for Logarithms

1. $\log_a(M \cdot N) = \log_a M + \log_a N$

2. $\log_a\left(\dfrac{M}{N}\right) = \log_a M - \log_a N$

3. $\log_a M^p = p \cdot \log_a M$

4. $\log_a M = \dfrac{\log M}{\log a} = \dfrac{\ln M}{\ln a}$