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

Quadratic Functions

Standard form: $y = ax^2 + bx + c$

Vertex form: $y = a(x - h)^2 + k$

The Quadratic Formula

The solutions of $ax^2 + bx + c = 0$, $a \neq 0$ are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Compound Interest Formulas: $A = P\left(1 + \dfrac{APR}{n}\right)^{n \cdot Y}$ $\quad A = Pe^{APR \cdot Y}$

A = accumulated amount, P = Principal, APR = annual percentage rate, Y = number of years, n = number of annual compoundings

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

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

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

Laws of Exponents

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

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

Properties for Logarithms

1. $\log_a(M \cdot N) = \log_a M + \log_a N$	4. $\log_a M = \dfrac{\log M}{\log a} = \dfrac{\ln M}{\ln a}$
2. $\log_a\left(\dfrac{M}{N}\right) = \log_a M - \log_a N$	
3. $\log_a M^p = p \cdot \log_a M$	

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