Math Review (Chapter 1)

(I): College algebra and some basic calculus. For example:
(1) Relating graphs to equations (e.g., $y = ax + b$ is a straight line).
(2) The derivative of $f(x) = ax^\beta$ is $\frac{df}{dx} = \beta ax^{\beta - 1}$.
(3) The derivative of $f(x) = a + bx - cx^2$ is $\frac{df}{dx} = b - 2cx$.

(II): Basic course in economics.
(1) Use of graphs for economic analysis.
(2) Basic optimization. For example:
   If $x =$ output, $P =$ output price, a firm’s cost function is
   
   $c(x) = ax^\beta, \quad \beta > 1,$
   and the firm’s profits are given by
   
   $\pi = Px - ax^\beta,$
   then a profit-maximizing firm will
   operate where $P = \beta ax^{\beta - 1},$ implying input demand
   
   $x = \left( \frac{P}{\beta a} \right)^{\frac{1}{\beta - 1}}.$

If you are a bit rusty, don’t be intimidated. We will progress gradually with the mathematical analysis.