Problem 6.1. Assume the initial stock price of $S(0) = 83.00$, the continuously compounded interest rate $r = 0.045$, the stock's volatility $\sigma = 0.25$, and the continuous dividend yield $\delta = 0.02$.

What is the current price of a claim that pays $S(1)^3$ (at time−1, of course)?

Solution: Using the formula for the price of the prepaid forward we established in class, we get, in our usual notation,

$$F^{P}_{0,1}(S^3) = e^{-0.045 \times 83^3} e^{3(0.045-0.02)+0.5 \times 3 \times 2 \times 0.25^2} = \ldots = 710,711.474.$$