Homework 7

Discrete models

1. Trinomial model outcomes $m_1 = .05$, $m_2 = .02$ and $m_3 = -.01$. Interest rate, $r = .01$. Find all risk neutral measures.
2. Find all claims which can be replicated. (find linear space of claim values that correspond to a replicating portfolio)

Stochastic Diffentiation. Let W_t be Brownian motion.

3. Let $f(t, x) = x^m t^n$. Let $Z_t = f(t, W_t)$ find dZ_t.
4. Let $f(t, x) = e^{ptx^2}$ for p a constant. Let $Z_t = f(t, W_t)$ find dZ_t.

Integration.

5. Integrate $dX_t = (pX_t - rt)dt + \sigma dW_t$, with p, r, σ constants
6. Integrate $dX_t = (pX_t - rt^2)dt + t\sigma dW_t$, with p, r, σ constants