Homework for Lecture 7. Due Wed 3/10 at the beginning of class. Since we need to hand out solutions on Wed evening, absolutely no late HW will be accepted for any reason. (Sorry!)

1. **Stationary distributions**
   Consider a process $X_t$ given by
   \[ dX_t = \mu(X_t)dt + \sigma(X_t)dW_t \] (1)

   (a) Let $f$ is a 1-1 twice differentiable strictly increasing function, and set $Y_t = f(X_t)$. Find the equation corresponding to (1) for $Y_t$.
   (b) Find an $f$ so that the equation for $Y_t$ has no drift term.
   (c) Find an $f$ so that the equation for $Y_t$ has diffusion term $dW_t$ only.
   (d) Let assume that $X_t$ is stationary. Determine when $Y_t$ is stationary. Is there a converse?

2. **Jumps**
   Follow the lecture and show explicitly the form of $f_i(s, t)$ and $g_i(s, t)$ that are needed to set up the hedgeing strategy for option # 2 in terms of option # 1.

3. **More Jumps**
   Suppose that $Z_i$ has a normal distribution. Find the class of all possible risk neutral distributions when only $S$ and a money market bond are traded.