1. Agent 1 has quadratic utility function $-(\alpha_1 - y)^2$. His risk compensation for some random consumption bundle is 1/2. Agent 2 has a quadratic utility function with $\alpha_2 > \alpha_1$. What, if anything, can you conclude about agent 2’s risk compensation for the random consumption bundle?

2. An agent has the Cobb-Douglas utility function $u(c_1, c_2, c_3) = c_1^\alpha c_2^\beta c_3^{1-\alpha-\beta}$, where $\alpha > 0$, $\beta > 0$ and $\alpha + \beta < 1$. Does this agent have (state-independent) expected utility?

3. A prominent finance textbook states that if two payoffs $x$ and $y$ have $x$ mean-independent of $y$, and $y$ mean-independent of $x$, then $x$ and $y$ are independent. Is this true? If so, prove it. If not, find a counterexample.