## EXERCISE 6: <br> Choice Under Uncertainty I

Exercises 6.B.1, 6.B.3, 6.B.4, 6.C.1, 6.C.2, 6.C.5, 6.C.12, 6.C.15, 6.C.17, 6.C.18, Rubinstein 7.1, 7.3,7.5

## Part 2.

1. Mr. Fernandez is a strictly risk-averse resident of a seismically active area whose preferences are represented by a differentiable Bernoulli utility function $u(x)$. His initial wealth is $\$ W$. He thinks there is a $50 \%$ chance of a major earthquake, in which case he will suffer a loss of $\$ L$. The government offers him earthquake insurance at an actuarially fair rate. Mr. Fernandez has the right to buy any amount of insurance (i.e., if he buys $\$ I$ of insurance, he will get $\$ I$ in case of the earthquake).
a) How much insurance will Mr. Fernandez buy?
b) Suppose now that the government introduces a new program which, in case Mr. Fernandez has bought no insurance at all, would still compensate $50 \%$ of his losses. The government will continue to provide actuarially fair insurance, but those who buy any insurance will not be eligible for the new program. How much insurance will Mr. Fernandez be willing to buy in this case?.
2. (Demand for risky asset) A risk-averse individual has a differentiable Bernoulli utility function $u$ with a strictly positive derivative. He is offered a bet of winning $x$ with probability $p$ or losing $x$ with probability $(1-p)$ where $p>\frac{1}{2}$ (i.e., the odds favor him).
a) Show that for any given $x$ the agent may accept or reject taking the bet, depending on $p$ (you may do this in a diagram).
b) Show that for any given $p$ this individual will accept the bet with $x$ sufficiently small (hint: use the definition of the derivative at the initial wealth level).
