1 Homework #3 - Due November 11 (in class)

Do the following questions in your text:
Chapter 9: Questions 1, 5, 8, 14.
Chapter 12: Questions 8, 14, 15.
Chapter 7: Question 1.
Chapter 8: Quantitative Problems 3, 4, 8.

1. Since September 2008, the Fed’s assets have increased by roughly 250% and are now roughly 15% of GDP. Why do some analysts see this as troubling?

2. Let \( w \) denote wealth and suppose that agents’ utility function is given by:
\[
U(w) = kw - \frac{1}{2}w^2; \quad k > w
\]
What is the implication for agents’ absolute risk aversion as wealth increases? That is, are rich agents more or less risk averse than poor agents?

3. Within the context of the expected utility of consumption under uncertainty, define the term: certainty equivalence of consumption. Demonstrate this graphically.

4. Suppose agents have utility of wealth given by the constant absolute risk aversion function:
\[
U(w) = -e^{-2w}
\]
where \( w \) denotes wealth and is assumed to be a normally distributed random variable with \( E(w) = 2 \) and \( Var(w) = 1 \). Calculate the certainty equivalent of wealth. Show this graphically.

5. Consider the following model of demand for insurance (identical to that studied in class): Risk-averse agents maximize expected utility of wealth where wealth is random due to a loss, \( x \), that has probability, \( p \). Insurance carries a premium, \( h \), and agents choose how much insurance to purchase, \( y \). Full insurance implies \( y = x \) while a deductible implies \( y < x \). Answer the following:

(a) It is assumed that insurance companies make zero profits. What does this imply for the value of \( h \)?
(b) Let wealth in the no loss state be denoted \( W_1 \) while wealth in the loss state is denoted \( W_2 \). What is the rate at which agents can transfer wealth between the loss and no-loss states via the purchase of insurance?
(c) What is the slope of an agent’s indifference curves?
(d) Prove that agents purchase full insurance.