

Math 407 Homework 4
Due by 5pm on **Friday, Feb 2**

Neatly write (or better yet, type up) your answers to the following questions and submit a pdf copy.

1. A decision maker has utility function $u(w) = w^{1/3}$. She is given the choice between two random amounts X_1 and X_2 , in exchange for her entire present wealth w_0 . Suppose that

$$X_1 = \begin{cases} 8 & \text{with probability 0.5} \\ 27 & \text{with probability 0.5} \end{cases}$$

and

$$X_2 = \begin{cases} 1 & \text{with probability 0.6} \\ 64 & \text{with probability 0.4} \end{cases}$$

- (a) Show that she prefers X_1 to X_2 .
 - (b) Determine for what values of w_0 she should decline the offer.
 - (c) Give an example of an utility function in which she would prefer X_2 to X_1 .
2. Recall that the iso-elastic property says that for any $k > 0$, $u(kw) = f(k)u(w) + g(k)$ for some $f(k)$ and $g(k)$.
- (a) Identify the functions $f(k)$ and $g(k)$ in the case of $u(w) = \ln w$.
 - (b) Identify the functions $f(k)$ and $g(k)$ in the case of $u(w) = \frac{w^\lambda - 1}{\lambda}$.
3. Recall that the Arrow-Pratt absolute risk aversion function is given by $A(w) = \frac{-u''(w)}{u'(w)}$.
- (a) Compute $A(w)$ in the case of $u(w) = \ln w$. Is $A(w)$ is non-increasing?
 - (b) Compute $A(w)$ in the case of $u(w) = \frac{w^\lambda - 1}{\lambda}$. Is $A(w)$ is non-increasing?