Question 1 (P6.1)

For each of the following utility functions, determine its risk tolerance and degree of absolute risk aversion.

(a) The quadratic utility function: $u(w) = w - \beta w^2$

(b) The logarithmic utility function: $u(w) = ln\ w$

(c) The power utility function: $u(w) = sgn(\beta)\ w^\beta$

$$\text{Note:}\quad sgn(x) = \begin{cases} -1 & \text{if } x < 0 \\ 0 & \text{if } x = 0 \\ 1 & \text{if } x > 0 \end{cases}$$

Question 2 (P6.2)

John has the utility function $u(x) = 1 - 3^{-x/50}$ over the range of $x = -\$50$ to $\$5000$.

(a) What is John's risk attitude?

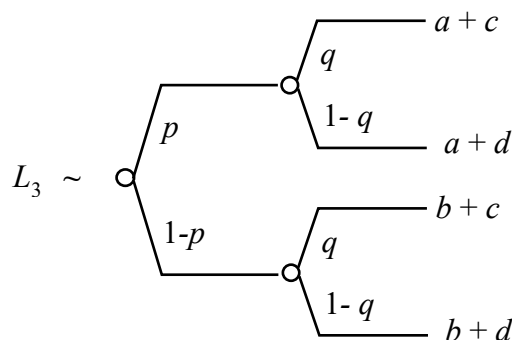**(b)** What is John's degree of absolute risk aversion?

(c) At what probability (p) of winning $\$50$ versus losing $\$50$ with $(1 - p)$ probability is John indifferent between having this deal and not having this deal?

Question 3 (P6.3)

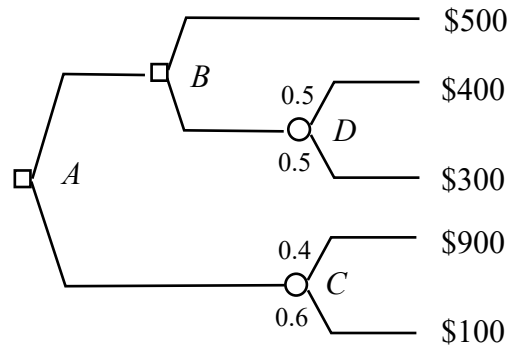Jim follows the *delta property* and owns two independent deals L_1 and L_2,
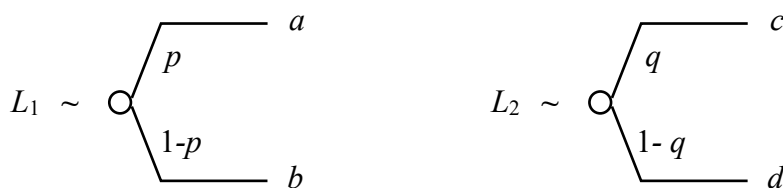
where a, b, c, and d are prospects in dollars. Let L_3 be the following compound deal:

Show that the certainty equivalent of L_3 is the sum of the certain equivalents of L_1 and L_2.

Question 4 (P6.4)
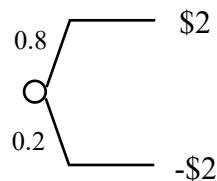
George is faced with the following decision problem:

If George has a constant risk tolerance of $1,000 for dollar amounts between -$1,000 and $2,500, what is his *preference probability* for decision A with respect to the outcomes $2,500 and -$1,000?

Question 5 (P6.5)

Susan follows the delta property. She is indifferent between accepting and rejecting the following free deal:

(*a*) What is Susan's risk tolerance?

(*b*) What is Susan's risk attitude?

(*c*) What's Susan utility function such that $u(\$0) = 0$ and $u(\$5) = 1$.

Question 6 (P6.6)

Susan has the wealth utility function $u(w) = \dfrac{w^2}{2000}$, $w \geq 0$, where w is total assets in dollars. Her current wealth is worth \$200, and she faces the following deal:
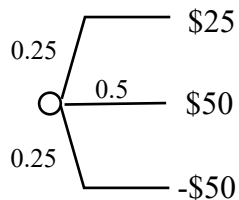
(a) What is Susan's personal indifference selling price for this deal?

(b) What is Susan's personal indifference buying price for this deal?