Probability & Statistics III (Term 2) - Homework 5

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Problem 1.
An investor can choose between two investments, A and B, with pay-offs (£) according to the following probability distributions:

Pay-off	A	B
50	1/3	1/4
100	1/3	1/2
150	1/3	1/4

(a) If his utility function for the pay-offs in this situation (so assuming no further assets taken into account) is given by $U_1(£x) = 1 - e^{-x/100}$, which investment option would he choose? Derive the value of the certainty equivalents for each of these two investments corresponding to this utility function.

(b) Answer the same questions as in (a), but now if his utility function is $U_2(£x) = \left(\frac{x}{100}\right)^{3/2}$.

(c) Derive the local risk aversions corresponding to each of the utility functions $U_1(\cdot)$ and $U_2(\cdot)$, and comment on the investor's behaviour towards risk in both cases (a) and (b).

Problem 2.
Suppose that a person's utility function for total wealth is

$$U(x) = 200x - x^2,$$

for $0 \leq x \leq 100$, with x total wealth in thousands of pounds.

(a) Sketch this utility function. Describe this person's attitude towards risk.

(b) If the person's total assets are currently £10K, should she take a bet in which she will win £10K with probability 0.6 and lose £10K with probability 0.4?

(c) If the person's total assets are currently £90K, should she take the bet given in part (b)?

(d) Compare your answers to parts (b) and (c). Does the person's betting behaviour seem reasonable to you?