University of Saskatchewan
Department of Economics
Economics 417.3
Homework #2

1. **Risk premium.** (This is a rewording of exercise 1 in page 586 of Ray's textbook). In each of cases (a)–(d), assume that you always have the option to keep extra funds in the bank at a 10% rate of interest with no fear of losing any of these funds. For each case, calculate the minimum rate of interest and, therefore, the risk premium, at which you would lend $1,000 on the informal market.

   (a) With probability 1/2 the loan will be repaid with interest, and with probability 1/2 the loan will not be repaid at all.

   (b) With probability 1/2 the loan will be repaid with interest, and with probability 1/2 only the principal will be repaid.

   (c) With probability 1/3 the loan will be repaid with interest, with probability 1/3 only the principal will be repaid, and with probability 1/3 the loan will not be repaid at all.

   (d) With probability 1/2 the loan will be repaid with interest, and with probability 1/2 the loan will not be repaid but there is a 1/2 probability of recovering assets from the borrower worth $500.

Table 1

Loan size ($)	**Loans defaulted (%)**
50-99	5
100-149	10
150-199	20
200-249	25
250-300	30
>300	50

2. **Credit rationing**. (This is a rewording of exercise 2 in page 586 of Ray's textbook.) Table 1 gives default risks for various loan sizes in an informal credit market. Suppose that the rate of interest in the informal sector is 18% per year and that in the formal sector (with no default) is 10% per year.

   (a) Calculate the maximum loan size that will be offered in the informal-sector credit market. (Show your work)

   (b) For what minimum rate of interest will loans in the $250-300 category be offered?

3. In the town of Ondartza the harvest can take two values: \$3,000 if all works well and \$1,000 if there is some damage to the crop. With greater care and better application of inputs, each farmer can produce the better output with probability 0.7, but if he underapplies inputs the probability falls to 0.4. Suppose that their utility function is given by $u(x) = x$. Finally, let the additional cost of diligence assume the value 500 in utility units.

   (a) Check that in isolation each farmer will indeed put in the higher level of effort.

   (b) Explain the incentive problem that perfect insurance faces in this case. What is the solution to this problem?

   (c) Solve for the second-best insurance scheme for the town of Ondartza.