Solutions to Math 481 Attendance QUIZ for Lecture 1

4. (This is open-ended, there are not "correct answers")

a. Would you be willing to pay \$100 for a lottery ticket that with probility 0.99 would yield \$200?

Sol. to a: Most people would, since the expected gain is almost \$100, but if you are really risk-averse, and hate gambling, you would not want to take the small, but positive chance of losing \$100.

The expected gain of this gamble is

$$0.99 \cdot 200 - 100 = 198 - 100 = 98 \quad ,$$

a really good deal!

b. Would you be willing to pay \$100 for a lottery ticket that with probility 0.4 would yield \$200?

Sol. of b: No! This would be really stupid, since the expected gain is

$$200 \cdot 0.4 - 100 = -20 \quad .$$

c. Would you be willing to pay \$100 for a lottery ticket that with probility 0.01 would yield \$1000000?

Sol. of c.: From a 'rational point of view', if you follow the textbook recommendation, you should buy this, since the expected gain is

$$1000000 \cdot 0.01 - 100 = 10000 - 100 = 99900 \quad ,$$

Wow, what a good deal! **But** you would be stupid, since with very high probablity you will lose \$100.

You should only agree if you can buy MANY such tickets, then by the law of large numbers you will be rich, but you need to ny MANY of them.