Expected Value of Lottery Ticket NAME:

The Illinois Lotto consists of six numbers chosen from 1 to 54. The table below has the prizes and the associated probabilities for Lotto (1999 Illinois Lottery pamphlet).

How to Win Lotto	Probability	Prize
Grand Prize: Match all six numbers in any order	.00000007744	$2 million
Second Prize: Match five of the six numbers in any order	.00002230	$2500
Third Prize: Match four of the six numbers in any order	.00131	$75
Overall Probability of winning a prize	.00133	***

Consider that it costs $1 to buy a ticket. Complete the table below by finding the probability of a losing ticket and the actual prize winnings for each of the four possibilities.

How to Win Lotto	Probability	Actual Prize Winnings
Grand Prize: Match all six numbers in any order	.00000007744	
Second Prize: Match five of the six numbers in any order	.00002230	
Third Prize: Match four of the six numbers in any order	.00131	
Losing Ticket: did not get any of the above winning combinations		

1. Now let X be the actual prize winnings from the ticket. Calculate the expected value of X. This is the expected value of a lottery ticket from the consumer's perspective. Show work.

2. Does it surprise you that the expected value is negative? Why should it be?

3. What does it mean for the consumer, on average, if the expected value of a lottery ticket is negative?