

Worksheet on Background

CMPUT 397
September 15, 2020

1. Suppose that in a lottery you have 0.01% chance of winning and the prize is \$1000. The ticket to enter the lottery costs you \$10. What is the expected amount you would earn, when buying a ticket for this lottery?

2. Adam and Martha propose a simple dice game to you. You can throw a die up to two times, and they will reward you with the amount equivalent to the face value of the die. If you throw a die once and 3 comes up, you can choose to take \$3 or throw again. If you choose to throw again and 2 comes up, you earn only \$2. The amount you earn is not additive and you only earn the amount of your last roll.
 - (a) Suppose in your first roll, the dice comes up as a 1. What is the expected amount you would earn in your second roll?
 - (b) For what values in your first roll should you re-roll the die?
 - (c) What is the expected amount you would earn in this game if you play optimally?