

### Lecture Examples

**Ex 1** What is the expected value of rolling a six-sided die if the number of points awarded is twice what you rolled (e.g. you get 2 points for rolling a 1, 4 points for rolling a 2, etc.)?

**Ex 2** A game is played in which you bet \$1 on a number between 1 and 100. If your number matches the computer's randomly chosen number, you win \$50. If you're wrong, you lose the dollar you bet. Is this game worth playing?

**Ex 3** You run a store and find that your possible profits for next month have the following probability distribution:

Profit	-\$10	\$0	\$10	\$20
Probability	.3	.5	.15	.05

What is the expected value of your profit next month?

**Ex 4** On a multiple choice test with 5 possible answers for each question, (a) through (e), you get 1 point for each correct answer and lose  $\frac{1}{2}$  point for each incorrect answer. Find the expected value of a random guess.

**On-Your-Own Examples**

- Ex 1** You have been offered a chance to play a dice game where you roll a single six-sided die and if you roll a 1, 2, 3, or 6, you win \$50, but if you roll a 4 or 5, you lose \$70. Find the expected value of the game. Is it worth playing?
- Ex 2** A dice game requires a \$1 bet to play. If you roll two six-sided dice and the sum of the dice is 11 or more, you keep your dollar and win an additional \$10. For any other roll, you lose your dollar. Is it worth playing this game?
- Ex 3** Consider the following game: three coins are flipped. If all three coins match, you win \$10; if exactly two heads are flipped, you lose \$4; and if exactly two tails are flipped, you lose \$3. What is the expected value of playing this game?

**Ex 4** Find the expected value of buying a ticket for a 6/41 lottery if the ticket costs \$1, the first prize is worth \$1 million, and the second prize is worth \$10,000.

**Ex 5** In the 6/41 lottery described above, assume the second prize remains \$10,000. How much would the first prize need to be in order for it to be worth playing the lottery?