

Act. #32

Expected Value

Name: _____

The average winnings if you play the game a large number of times

$$EV = (\text{value}_A \times p(A)) + (\text{value}_B \times p(B)) + \dots + (\text{value}_n \times p(n)) - (\text{cost to play})$$

If $EV > \$0.01$, then the game is considered 'worth playing'.

- 1). Find the expected value from playing a game in which you win \$950:
 - a). by correctly calling heads or tails when you flip a coin.
 - b). by correctly calling heads or tails on each of five flips of a coin.

- 2). A magazine subscription service is having a contest in which the prize is \$80,000. If the company receives 1 million entries, what is the expected value of the contest?

- 3). A box contains one each of \$1, \$5, \$10, \$20, \$50, \$100 bills. You reach in and withdraw one bill.
 - a). What is the expected value?
 - b). What is the expected value it costs \$20 to draw?

- 4). A realtor who takes the listing on a house to be sold knows that she will spend \$800 trying to sell the house. If she sells the house herself, she will earn 6% of the selling price. If another realtor sells a house from her list, the first realtor will earn only 3% of the price. If the house remains unsold for 6 months, she will lose the listing.

Suppose the probabilities are as follows:

Event	Probability
Sell herself	0.50
Sell by another	0.30
Not sell in 6 mo.	0.20

What is the expected profit from listing a \$185,000 house?

- 5). Assume a dart is randomly thrown at the following dart board and that it strikes the board each time. The payoffs are listed below. Find the expected value of the game. How much would you be willing to pay to play the game?

\$1.00	\$6.00	
	\$8.00	\$10.00
	\$4.00	