Homework SS: Expected Value

Due: Day of TEST #2

Name:

1) Complete the PDF to the right, then find the expected value of $X, E(X)$.

x	$P(X = x)$	$x \cdot P(X = x)$
0	0.3	
1	0.2	
2		
3	0.4	

2) Suppose that you are offered the following "deal": You roll a die. If you roll a 6, you win \$12. If you roll a 4 or 5, you win \$4. If you roll a 1, 2, or 3, you pay \$10.

(a) If the random variable X represents the amount of winnings, list the values that X may take on.

(b) Construct a PDF. Round answers to two decimal places when necessary.

Number rolled	x	$P(X = x)$	$x \cdot P(X = x)$
6			
4 or 5			
1, 2, or 3			

(c) What is the expected average winnings per game?

(d) Based on your answer to part (c), should you take the deal? Why or why not?

(e) Compute the standard deviation of X.

3) A theater group holds a fund-raiser. It sells 100 raffle tickets for $7 apiece. Suppose you purchase four tickets. The prize is two passes to a Broadway show, worth a total of $150.

(a) If the random variable X represents the value of the winnings, list the values that X may take on.

(b) Construct a PDF. Round answers to two decimal places when necessary.

	x	$P(X = x)$	$x \cdot P(X = x)$
If you lose			
If you win			

(c) If this fund-raiser is repeated often and you always purchase four tickets, what would be your expected average winnings per raffle?

4) A game involves selecting a card from a deck of cards and tossing a coin. The deck has 52 cards and 12 are "face cards" (Jack, Queen, or King). The coin is a fair coin and is equally likely to land on heads or tails. If the card is a face card AND the coin lands on heads, you win $4. If the card is a face card AND the coin lands on tails, you win $2. If the card is NOT a face card, you lose $2, regardless of what the coin shows. Find the expected value for this game. (Constructing a PDF table would be helpful).

5) You buy a lottery ticket to a lottery that costs $10 per ticket. There are only 100 tickets available to be sold in this lottery. There is one $500 prize, two $110 prizes, and four $20 prizes. Find your expected gain or loss. (Constructing a PDF table would be helpful).