Act. #49
"Expected Value Practice"

1

The number of household members, x, living in Cityville homes has the following probability distribution:

x	1	2	3	4	5	6	7	8
p(x)	0.21	0.28	0.16	0.22	0.06	0.04	0.02	0.01

What is the expected size of a household in Cherryville?

a) 2.43 b) 2.89 c) 3.17 d) 4.50

2

It costs a bakery $3.50 to make apple pies that sell for $12 the first day they are baked.

* If a pie is not sold on the first day, the new price is $8.50.
* The probability of selling the apple pie the first day is 75%.
* There is a 12% probability of selling it on the second day.
* If the apple pie does not sell by the end of the second day, it is donated.

What is the approximate expected profit per pie for the bakery on the sales of its pies?

a) $5.67 b) $6.52 c) $9.57 d) $10.02

3

The table shows the probability distribution of the number of televisions in each house in a community.

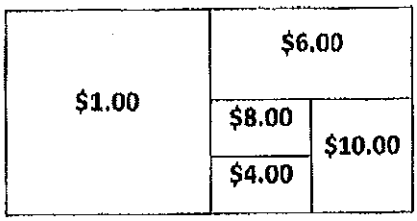
Televisions	Probability
0	0.04
1	0.38
2	0.27
3	x
4	y
5 or more	0.13

What is the probability that a house in the community will have at least 3 televisions?

a) 0.69 b) 0.31

c) 0.18 d) 0.09

4 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?



5 A game involves drawing a single card from a standard deck. If an ace is drawn, you receive $.50; if a heart is drawn, you receive $.25; if the queen of spades is dawn, you receive $1.00. If the cost of playing is $.10, what is the game's expected value? Should you play the game?

6 Abby took an 8-question multiple-choice quiz. Suppose that her probability of correctly answering any question is 0.75. What is Abby's probability of incorrectly answering exactly two questions on the quiz?

a) 0.089 b) .240 c) .311 d) .623

7 If the probability of giving birth to a boy is 52%, what is the ***approximate*** probability of giving birth to 4 consecutive boys?

a) 0.021 b) 0.062 c) 0.073 d) 0.130

8 How many more ways can 10 juniors running for the positions of President, Vice-President, Secretary, and Treasurer be selected when compared to 12 sophomores running for 5 identical positions of Class Representative?

a) 94,830 b) 11,628 c) 4,320 d) 4,248

(9)

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?

(10)

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?

(11)

Suppose that you have 5 quarters, 5 dimes, 10 nickels, and 5 pennies in your pocket. You reach in and choose a coin at random. What is the expected value of a single draw? Which coin is most likely to be picked?

(12)

A punch-out card contains 100 spaces. One space pays $100, 5 spaces pay $10, and the rest of the spaces pay $0. How much should you pay to punch out one space?

(13) George gained $583 of interest in 4 years after depositing $2000 compounded continuously. What was his interest rate?

(14) Solve: $\ln(5x+3) - 10 = -14$