Test Your Knowledge– Probability Distributions and Expected Value

Name_____

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Determine whether the following is a probability distribution. If not, identify the requirement that is not satisfied.

1) 1) _____

x	P(x)
0	0.31
1	0.18
2	0.29
3	0.16
4	0.06

2) 2) _____

x	P(x)
0	0.248
1	0.131
2	0.196
3	0.097
4	0.245
5	0.109

3) 3) _____

x	P(x)
0	0.186
1	0.307
2	–0.021
3	0.074
4	0.121
5	0.333

4) In a certain town, 70% of adults have a college degree. The accompanying table describes the probability distribution for the number of adults (among 4 randomly selected adults) who have a college degree. 4) _____

x	P(x)
0	0.0081
1	0.0756
2	0.2646
3	0.4116
4	0.2401

Find the mean of the given probability distribution.

5) 5) _____

x	P(x)
0	0.19
1	0.11
2	0.30
3	0.06
4	0.34

6) The accompanying table shows the probability distribution for x, the number that shows up when a loaded die is rolled. 6) _____

x	P(x)
1	0.12
2	0.10
3	0.12
4	0.14
5	0.15
6	0.37

Solve the problem.

7) Find the standard deviation for the given probability distribution. 7) _____

x	P(x)
0	0.12
1	0.17
2	0.17
3	0.28
4	0.26

8) In a certain town, 40% of adults have a college degree. The accompanying table describes the probability distribution for the number of adults (among 4 randomly selected adults) who have a college degree. Find the standard deviation for the probability distribution. 8) _____

x	P(x)
0	0.1296
1	0.3456
2	0.3456
3	0.1536
4	0.0256

9) In a game, you have a 1/29 probability of winning \$106 and a 28/29 probability of losing \$9. What is your expected value? 9) _____

10) A contractor is considering a sale that promises a profit of \$35,000 with a probability of 0.7 or a loss (due to bad weather, strikes, and such) of \$6000 with a probability of 0.3. What is the expected profit? 10) _____

11) Suppose you pay \$2.00 to roll a fair die with the understanding that you will get back \$4.00 for rolling a 6 or a 5, nothing otherwise. What is your expected value? 11) _____

12) Suppose you buy 1 ticket for \$1 out of a lottery of 1,000 tickets where the prize for the one winning ticket is to be \$500. What is your expected value? 12) _____

13) A 28-year-old man pays \$208 for a one-year life insurance policy with coverage of \$110,000. If the probability that he will live through the year is 0.9993, what is the expected value for the insurance policy? 13) _____

14) The prizes that can be won in a sweepstakes are listed below together with the chances of winning each one: 14) _____
\$4800 (1 chance in 8300); \$1700 (1 chance in 5300); \$900 (1 chance in 4600);
\$300 (1 chance in 2700).
Find the expected value of the amount won for one entry if the cost of entering is 65 cents.

Answer Key
Testname: UNTITLED1.TST

1) Probability distribution.
2) Not a probability distribution. The sum of the P(x)'s is not 1.
3) Not a probability distribution. One of the P(x)'s is negative.
4) Probability distribution
5) 2.25
6) 4.21
7) 1.35
8) 0.98
9) -$5.03
10) $22,700
11) -$0.67
12) -$0.50
13) -$131.00
14) $0.56