## **Expected Value Problems**

## Hint: To find the expected value use the formula $\sum x \cdot p(x)$

<ol> <li>In a game, you have a 1 probability of winning \$116 and a 44 probability of losing \$7.</li> <li>What is your expected value?</li> </ol>						
A) -\$4.27	<b>B</b> ) \$2.58	<b>C</b> ) -\$6.84	<b>D</b> ) \$9.42			
<ul><li>2) A contractor is consi</li><li>(due to bad weather, str</li></ul>	dering a sale that promis ikes, and such) of \$18,00	es a profit of \$38,000 wi 00 with a probability of 0	th a probability of 0.7 or a loss 0.3. What is the expected profit	<b>2</b> ) ?		
<b>A</b> ) \$21 200	<b>B</b> ) \$20,000	<b>C)</b> \$26 600	<b>D</b> ) \$39 200			
<ul> <li>3) Suppose you pay \$3.00 to roll a fair die with the understanding that you will get back \$5.00 for 3)</li> <li>colling a 5 or a 4, nothing otherwise. What is your expected value of your gain or loss?</li> </ul>						
A) - \$3.00	<b>B</b> ) \$5.00	<b>C</b> ) \$3.00	<b>D</b> ) -\$1.33			
<ul> <li>4) Suppose you buy 1 ticket for \$1 out of a lottery of 1000 tickets where the prize for the one winning 4)</li></ul>						
<b>A</b> ) \$40.00	<b>B</b> ) \$4.00	<b>C</b> ) \$0.40	<b>D</b> ) -\$0.40			
5) A 28-year-old man pays \$159 for a one-year life insurance policy with coverage of \$140,000. If the 5) probability that he will live through the year is 0.9994, what is the expected value for the insurance policy?						
<b>A</b> ) -\$158.90	<b>B</b> ) \$139,916.00	<b>C</b> ) - \$75.00	<b>D</b> ) \$84.00			

6) The prizes that can be won in a sweepstakes are listed below together with the chances of winning each one:\$3500 (1 chance in 8100); \$1900 (1 chance in 5400); \$700 (1 chance in 3400); \$400 (1 chance in 2500). Find the expected value of the amount won for one entry if the cost of entering is 66 cents.

A) -\$0.49 B) \$0.49 C) 4.9 D) -\$4.9

7) On a multiple-choice test, a student is given five possible answers for each question. The student
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**A**) 0 **B**) 0.25 **C**) 0.133 **D**) -0.33

8) Suppose also that on one of the questions you can eliminate two of the five answers as being wrong.8) \_\_\_\_\_If you guess at one of the remaining three answers, what is your expected gain or loss on the question?

**A**) 0 **B**) 0.167 **C**) 0.133 **D**) 0.63

**9**) A dairy farmer estimates for the next year the farm's cows will produce about 25,000 gallons of milk. **9**) \_\_\_\_\_ Because of variation in the market price of milk and cost of feeding the cows, the profit per gallon may vary with the probabilities given in the table below. Estimate the profit on the 25,000 gallons.

	Gain per gallon	\$1.10	\$0.90	\$0.70	\$0.40	\$0.00	-\$0.10
	Probability	0.30	0.38	0.20	0.06	0.04	0.02
<b>A</b> ) \$21,850	<b>B</b> ) \$20,508		<b>C</b> ) \$20,580		<b>D</b> ) \$20,850		

**10**) At many airports, a person can pay only \$1.00 for a \$100,000 life insurance policy covering the duration of the flight. In other words, the insurance company pays \$100,000 if the insured person dies from a possible flight crash; otherwise the company gains \$1.00 (before expenses). Suppose that past records indicate 0.45 deaths per million passengers.

How much can the company expect to gain on one policy?

<b>A</b> ) \$0.895	<b>B</b> ) \$0.955	<b>C</b> ) \$0.95	<b>D</b> ) \$0.855
On 100,000 policies?			
<b>A</b> ) \$89,500	<b>B</b> ) \$95,500	<b>C</b> ) \$95,000	<b>D</b> ) \$85,500

11) A construction company wants to submit a bid for remodeling a school. The estimated bid
11) \_\_\_\_\_\_
cost \$4000 for construction company. If the bid were accepted, the company would have revenue of \$26,000.
Would you advise the company to spend the \$4000 if the bid has only 20% probability of being accepted?
Explain your reasoning.

A)	\$2.000	<b>B</b> ) \$1.500	<b>C</b> ) \$1,000	<b>D</b> ) \$1.200
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