MATH 422 **Week 10 Quiz** Name_____
Date_____

Directions: Answer each question to the best of your ability. **Show your reasoning** and/or process used to answer the question(s) where it is appropriate. A calculator will be helpful for this quiz. There are 5 questions.

Give your answers to probability questions as a fraction or decimal rounded to 3 decimal places.

1. (3 pts) Complete the table and calculate the Expected Value for this probability distribution.

x	P(x)	$x \cdot P(x)$	Expected Value
0 (no claim)	0.96		
500	0.02		
2000	0.01		
10,000	0.01		

2. (3 pts) The ***above table*** represents average probabilities of auto insurance policyholders making a claim and what the company pays out per incident/claim. To cover cost, what should the insurance company charge for each policy?

3. (3 pts) A certain politician uses the word 'woke' in public speeches about 81% of the time. Two friends have a bet… when the word is spoken, the first friend must pay $1. If it is not spoken, the second friend must pay $4. Which friend is most likely to benefit from this arrangement? Why?

4. (3 pts) A bag contains 1 gold marble, 5 silver marbles, and 22 black marbles. Someone is 'selling' the following game to a crowd of onlookers: You (the player) randomly select one marble from the bag. If it is gold, you win $6. If it is silver, you win $3. If it is black, you lose $1.

What is the (average) expected value if you play this game?

5. (3 pts) A company estimates that 3% of their products will fail *after* the original warranty period but within 2 years of the purchase, with a replacement cost of $800. [Hint: There are two outcomes for x]
If they offer a 2-year extended warranty for $30, what is the company's expected value of each warranty sold?

Formulas:

Expected Value: Given a sample space of ***n*** outcomes (**x**) and their probabilities – **Pr(x)**, the "expected value" of this event or observation is given by:

$$E(x) = x_1 \cdot \Pr(x_1) + x_2 \cdot \Pr(x_2) + \cdots + x_n \cdot \Pr(x_n)$$