

Name: _____

Exam I - Math 132

- Show all of your work, and clearly indicate what your final answer is. If there are two apparent answers for one question, you will receive no credit for that problem.
- Leave numbers as exact answers. $\frac{1}{3}$ is fine, but .333 is not an acceptable answer.

Problem	Out of	Your Score
1	25	
2	25	
Total	50	

1. While at home for the summer Hermione Granger happens across a puzzle loving warlock and his house elf who are just coming back from their holiday in the States. As the founder of the Society for the Promotion of Elvish Welfare (S.P.E.W.), she feels it is her duty to try and convince the warlock to free the house elf from his service. The warlock decides that he will free the elf if Hermione can figure out how much change he has remaining from his trip to the U.S. "I have twice as many nickels as I have dimes, and I have two more dimes than I have quarters" starts the warlock. "If I have 21 coins in all and \$1.37 in coins, how many of each coin do I have?"

- Assuming the warlock has q quarters, d dimes, n nickels, and p pennies; write an equation which relates the number of pennies, number of nickels, number of dimes, and number of quarters the warlock has to the total amount of money he has in his pocket. (4 points)

- Write an equation which relates the number of pennies, number of nickels, number of dimes, and number of quarters the warlock has to the total number of coins he has in his pocket. (4 points)

- In both of the above equations, isolate the variable representing “the number of pennies”, and then treat it as a “dummy” variable so you can find a new equation that no longer has that variable. (6 points)

- Write an equation which relates d to n and a second equation relating d to q ; in each case write the equation so that d is isolated. (3 points each)

- Solve the wizard’s riddle. (5 points)

2. Professor McGonagall gave her students an exam that had an easy question and a really hard question where it was expected (based on previous years she had asked these questions) that 90% of the students would get the easy question correct and only 5% would get the hard question correct. Due to all the craziness that goes on at Hogwart's, Minerva typically makes a mistake on grading. Since it is easier to follow the reasoning in a correct answer than an incorrect answer she usually marks a right answer as wrong about 5% of the time and a wrong answer as right about 10% of the time. Fill in the following table with the probability distribution for the easy question and the hard question (15 points)

HARD	Answered correctly	Answered incorrectly
Graded correctly		
Graded incorrectly		

EASY	Answered correctly	Answered incorrectly
Graded correctly		
Graded incorrectly		

- What is the probability that a student that had the hard question marked as correct actually answered it correctly? (5 points)
- Hermione notices that Ron got both the hard and easy question marked wrong and she suggests that he should contest the grading on the easy question, but it's probably not worth contesting the harder question. Why would she suggest this? (5 points)