

MATH-1230 (DUPRÉ) FALL 2010 TEST 1 ANSWERS

FIRST: PRINT YOUR LAST NAME IN LARGE CAPITAL LETTERS ON THE UPPER RIGHT CORNER OF THIS SHEET.

SECOND: PRINT YOUR FIRST NAME IN CAPITAL LETTERS DIRECTLY UNDERNEATH YOUR LAST NAME.

THIRD: WRITE YOUR FALL 2010 MATH-1110 LAB DAY DIRECTLY UNDERNEATH YOU FIRST NAME.

You find two gold nuggets which your great grandparents left you. You pick up one in each hand and can feel that the nugget in your right hand is heavier than the nugget in your left hand. You guess the nugget in your left hand weighs 4 ounces.

1. Of the numbers below, circle the numbers which are NOT possible for your guess of the weight of the nugget in your right hand, according to our rules for guessing.

0 1 2 3 4 5 6 8

ANSWER: Circle all numbers **LESS THAN** 4, but **DO NOT** circle the 4 itself.

2. In the year 1955 Gold was worth 35 dollars an ounce. According to our rules for guessing, what should you guess was the value of the nugget in your left hand in dollars in the year 1955?

ANSWER: Just multiply the guess for weight in ounces by the given value in dollars per ounce, so the answer is in 1955 dollars:

$$Value = (35)(4) = 140.$$

3. If you guess that the nugget in your right hand weighs 7 ounces, then what should you guess is the total weight in ounces of the two nuggets together?

ANSWER: Just add the two guesses for each of the nuggets, so the total weight in ounces, T , should be guessed to be:

$$E(T|K) = 4 + 7 = 11.$$

4. If you guess there is a 30 percent chance that at todays gold prices the nugget in your left hand is worth over 5 thousand dollars, then what is the percentage chance that it is worth no more than 5 thousand dollars?

ANSWER: Using the general fact that

$$P(\text{not } A|K) = 1 - P(A|K),$$

the percentage chance that it is worth no more than 5 thousand dollars is:

$$(100)(1 - .3) = (100)(.7) = 70.$$

5. Imagine a deck of 5 cards where each card has one side which is solid blue and the other side has a whole number less than 6 written on it and no two cards have the same number. You see someone pick the cards up off the table and stack them so all the blue faces are up. The person then shuffles the deck so you cannot tell which card is where in the deck. Next, the person begins turning up the cards one after another taking them from the top of the deck and putting them back on the table. You see the first card turned up has a 2 written on it and you can see the bottom card has 4 written on it. Based on this information, what is the probability that the fourth card turned up will have a 5 on it?

ANSWER: Only three card positions in the deck remain unknown to you and the card with the 5 written on it could be in any one of those three places and none is more likely than another, so they are all equally likely. Thus the answer is P where

$$P = \frac{1}{3}.$$