MATH 170A: Probability Theory — Quiz 2
April 26, 2019

UCLA ID #

You have 20 minutes for this quiz. Write your answers neatly in the spaces provided below or on the back sheet. Make sure to include a thorough explanation of your solution – simply writing an answer with no justification will not be awarded points.

1. You oversee a large manufacturing operation for iPods that uses 10 fabrication facilities. Each facility produces an equal share of the iPods. From most fabrication plants, 1% of the resulting iPods will be defective. Unfortunately, the fabrication facility in Texas has some problems and 91% of the iPods it produces are defective. You pick a random iPod out of the store to test and find that it is not defective. What is the probability that it was produced at the plant in Texas?

10 fab fac

9/10 fac — 0.01 def

— 0.91 def

D – event of defective

T – event of texas

$P(D|T^c) = 0.01$

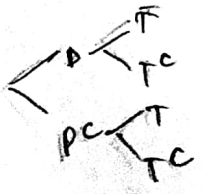
$P(D|T) = 0.91$ $P(D^c|T) = P(D) - P(D|T)$

$P(T) = 0.1$

$P(T^c) = 0.9$

$P(T|D^c) = \frac{P(D^c|T)P(T)}{P(D^c)} = \frac{P(D^c|T)P(T)}{1-P(D)} = \frac{(1-0.91)(0.1)}{1-(0.01+0.91)}$ need to multiply by P(T

$= \frac{0.9(0.1)}{0.80} = \frac{1}{}$



$13\overline{)52}$ 4, 52, 0

2. Suppose you are dealt five cards at random from a deck of 52 cards (recall a deck as 13 ranks, with 4 suits of each rank). What is the probability that you are dealt a "full-house"? Note: a "full-house" consists of two cards of the same rank, plus three cards of another rank (that match each other but not the first pair). The hands 33444, JJQQQ, KK555 are all examples of full-houses. Note: you do not need to simplify this probability.

$P = 1 \cdot \frac{12}{52} \cdot \frac{12}{13} \cdot \frac{12}{49} \cdot \frac{11}{48}$

1, 3, 1, 3, 4, chose another rank, 4