Andrew Owen

MATH 341

10/18/19

Homework 6

1. Webwork

2.

✓

3.

a)

b) Because this is the compliment of part a,

c)

4.

a) Marilyn is right, it appears that she is wrong because after the reveal of one of the three doors you will have one door with a goat and another door with a car. This makes it appear to be a 50/50 chance of picking the car door of the two doors (either by switching or not switching), this is not the case when put into simulations. The probability is actually 2/3 chance of picking the car if you switch. The most simple way to describe why this is the case is because you start with a 1/3 chance of picking the car right off the bat at the initial door selection. This chance does not change. The other two doors have a 2/3 chance of having the car after that initial selection. Once the host reveals one door that is not a car, that initial door you picked still has as 1/3 chance that it has the car behind it given that the other two may have the car. The door that the host did not open up has a 2/3 chance as it is given that the door that was revealed had a 1/3 chance as well. So the non-revealed door has 2/3 chance of having the car given that the initially selected door has a 1/3 chance of having the car.

b)

switches?

| No| Yes

Wins?\_\_\_\_\_|\_\_\_\_|\_\_\_\_

No | 330| 171

\_\_\_\_\_|\_\_\_\_|\_\_\_\_

Yes| 175| 324

This is the table that outputted once running 1000 simulations. This table shows that the probability of winning if you switch doors from your initially chosen door is double that from not switching. Probabilities must reach 100%, so it make no logical sense that not switching will leave you with a 50% chance of winning if 50%\*2 = 100% and 50%+100% = 150%, that breaks laws of math, so something is probably wrong. 33.33%\*2 = 66.667% + 33.33% = 100% though, meaning that switching must have 2/3 of a chance of winning while not switching has a 1/3 chance of winning.