AMERICAN UNIVERSITY PRECALCULUS MATH 170

WRITTEN ASSIGNMENT 2 **Applications of the Exponential Function**

1) Polluted water is passed through a series of filters. Each filter removes 75% of the remaining impurities. Initially, the unrelated water contains impurities at a level of 500 parts per million (ppm). Find a formula for L, the remaining level of impurities, after the water has been passed through a series of n filters

2) The Population of India was about 1.22 billion people in 2013 and was growing at a rate of about 1.28% per year.

a) Write a formula for the population P

, of India in billions as a function of years t since 2013.

b) If the growth rate stays constant, predict the population of India in the year 2015 and the year 2020.

c) Find the Average Rate of Change of India's population, from 2015 to 2020

d) What does your formula in part a predict when t = -3? (Give a practical interpretation of your answer)

e) Find the rate of change of India's population in **million** people per year during the year 2013.

3) Every year, teams from 64 colleges qualify to compete in the NCAA women's basketball playoffs. For each round , every team is paired with and opponent. A team is eliminated from the tournament once it loses a round. So, at the end of a round, only half of the teams move on to the next round. Let N be the number of teams remaining in competition after r rounds of the tournament have been played.

a) Find a formula for N(r) and graph y = N(r) (You can use desmos to provide a graph

b) In 2013, the Connecticut Huskies defeated the Louisville Cardinals 93 – 60 in the final round. How many rounds did Connecticut have to go through to win the championship ?