

**HOMEWORK #21**

**Due Friday, May 3rd in Gradescope by 11:59 pm**

**Exponential Growth** Answer the following. Justify. Simplify, and give full final answers. You can use Calculators on the final answers.

**For each problem, state the General Solution formula**

1. Suppose a population of bacteria grows exponentially. Suppose there are initially 100 bacteria. After 2 hours, the population grows to 900.

- How many are present after 5 hours?
- When does the population reach 10,000?

2. There are initially 12 cases of a disease which is growing exponentially. Four months later there are 1440 cases.

- How many cases after a year (12 months)?
- After how long are there 172,800 cases?

**Exponential Decay** Answer the following. As before, Justify. Simplify, and give full final answers.

3. A new car costs \$25,000 with value decreasing exponentially each year. After two years, the value of the car is \$20,250.

- First find the *Decay Constant*  $k$  and explain why the specific numerical value for  $k$  is negative.
- What will the value of the car be after 8 years?

4. The Half-Life of Carbon-14 is 5730 years.

- Find the exponential decay model/formula for the amount of Carbon-14 present after  $t$  years.
- If  $\frac{1}{10}$  of a bone sample remains, how long ago did the death occur?

# REGULAR OFFICE HOURS

**Monday: 12:00–3:00 pm**

**Tuesday: 1:00–4:00 pm**

7:30–9:00 pm TA Alexa, SMUDD **208a**

**Wednesday: 1:00-3:00 pm**

**Thursday: none for Professor**

6:00–7:30 pm TA Alexa, SMUDD **208a**

**Friday: 12:00–2:00 pm**

- You will be receiving a Link in email for my Teaching Evaluations. Please fill those out as they are very helpful for my teaching and reviews.
- Maintain an hour a day preparation for the last two exams.