

HOMework #21

Due Friday, May 5th in Gradescope by 11:59 pm ET.

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 Ellerman, SMUDD **204**

Wednesday: 1:00-3:00 pm

Thursday: none for Professor

7:30–9:00 pm TA Ellerman, SMUDD **207**

Friday: 12:00–2:00 pm

- Maintain an hour a day preparation for the last two exams.