Exam 1 - Practice 2

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The exam will consist of two parts: Part 1: Manual calculation and Part 2: Excel calculation.

Part 1: Manual calculation

Problem 1.

Given a simulated dataset below. The tuition is in thousands.

Year (x)	Tuition (y)
2020	10
2021	12.5
2022	15
2023	17.5
2024	20

1. Calculate the differences of tuition in consecutive years and ratio of tuition for consecutive years to determine if the data is exponential or linear.
2. Write the equation of the model.
3. Use the model to predict the tuition in 2030.
4. What year the tuition will be more than 100k?

Problem 2.

Given a simulated dataset below. The tuition is in thousands.

Year (since 2010)	Tuition
0	10
1	11.5
2	13.225
3	15.20875
4	17.4900625

1. Calculate the differences of tuition in consecutive years and ratio of tuition for consecutive years to determine if the data is exponential or linear.
2. Write the equation of the model.
3. Use the model to predict the tuition in 2030.
4. What year the tuition will be more than 100k?

Part 2: Excel Calculation

Year	Population (000s)
2012	1
2013	1.5
2014	2
2015	3
2016	5

1. Model the dataset using exponential model and calculate the MAPE of the model.
2. Model the dataset using linear model and calculate the MAPE of the model.
3. Compare the models in term of MAPE to decide the better model. Use the better model to predict the population in 2017.