Today you will use exponential growth and decay models, and logarithmic functions to solve real-life problems.

WARM UP

1. **How long would it take for an investment to triple if the interest were compounded continuously at 8.25%? (Use $A = Pe^{rt}$)**

3.5 Growth and Decay Models

EX1

The population y, in millions, of a large city can be modeled by $y = 1.8e^{0.026x}$, where $x = 0$ corresponds to 1990. In what year is the population of this city expected to reach 2.5 million?

EX2

The radioactive isotope ^{226}Ra has a half-life of 1620 years. If the original amount was 5 grams, how much would remain after 10,000 years? (Use $y = ae^{kt}$ to solve)

Today you will use scatter plots and graphing calculators to find the best-fitting model for a data set, and find exponential and logarithmic models.

3.6 Exponential and Logarithmic Regression Models

EX1

Determine which type of model, logarithmic or exponential, would best model the data.

$(2.5, 1.6), (3, 1.8), (3.5, 1.9), (4, 2.1), (4.5, 2.3), (5, 2.8), (5.5, 3.6), (6, 4.1), (6.5, 4.8), (7, 5.5), (7.5, 6.5), (8, 7.8)$

EX2

Use a graphing calculator to fit a logarithmic model to the following data:

x	2	3	4	5	10	15	20
y	3.16	4.38	5.24	5.91	8.00	9.22	10.09