Name _____ Score _____ Teacher _____ Date _____

Exponential Growth and Decay

Build an exact exponential model, then solve the contextual amount or time question.
Continuous percentages give k=r; periodic percentages give k=ln(1+r). Keep exact values until the final approximation.

1. Growth model

Assume exponential growth. A cell culture measures 1200 cells at t=6 hours and 2571 cells at t=13 hours. Let t be measured in hours from the stated origin t=0. Find the modeled amount at t=16 hours. Round the model estimate to the nearest whole cell. Write the model and show your work.

Model: _____

Work / substitution:

_____

_____

Answer (cells): _____

2. Decay model

Assume exponential decay. A laboratory sample measures 1240 grams at t=6 hours and 670 grams at t=13 hours. Let t be measured in hours from the stated origin t=0. Find the time t when the modeled amount reaches 469 grams. Round to 2 decimal places. Write the model and show your work.

Model: _____

Work / substitution:

_____

_____

Answer (hours): _____

3. Growth model

Assume exponential growth. A cell culture starts at 1200 cells and increases continuously at 4% per hour. Let t be measured in hours from the stated origin t=0. Find the modeled amount at t=16 hours. Round the model estimate to the nearest whole cell. Write the model and show your work.

Model: _____

Work / substitution:

_____

_____

Answer (cells): _____

Name _____ Score _____ Teacher _____ Date _____

Exponential Growth and Decay

Build an exact exponential model, then solve the contextual amount or time question.
Continuous percentages give k=r; periodic percentages give k=ln(1+r). Keep exact values until the final approximation.

4. Decay model

Assume exponential decay. A laboratory sample starts at 1240 grams and decreases continuously at 4% per hour. Let t be measured in hours from the stated origin t=0. Find the time t when the modeled amount reaches 620 grams. Round to 2 decimal places. Write the model and show your work.

Model: _____

Work / substitution:

_____

_____

Answer (hours): _____

5. Growth model

Assume exponential growth. A cell culture starts at 400 cells and doubles every 3 hours. Let t be measured in hours from the stated origin t=0. Find the time t when the modeled amount reaches 800 cells. Round to 2 decimal places. Write the model and show your work.

Model: _____

Work / substitution:

_____

_____

Answer (hours): _____

6. Decay model

Assume exponential decay. A laboratory sample starts at 440 grams and has a half-life of 4 days. Let t be measured in days from the stated origin t=0. Find the modeled amount at t=5 days. Round to 2 decimal places. Write the model and show your work.

Model: _____

Work / substitution:

_____

_____

Answer (grams): _____