1. You deposit $300 into an account that pays 2.5% annual interest compounded quarterly. How long will it take for the amount to grow to $500 if you do not deposit any more money?

2. You deposit $500 into an account that pays 10% interest compounded annually. How long will it take for your money to double?

3. A certain arthritis medication is eliminated from the bloodstream at the rate of about 20% per hour in adults. The original dosage of the medication is 40 mg. Write an equation for the exponential decay of the amount of medicine left in the bloodstream $y$ after $x$ hours. Then, find how long it will take for the medication to be less than 0.001 mg.

4. One hundred milligrams of Neptunium-236 decays radioactively according to the equation $y = 100e^{-0.0308x}$ where $x$ is in hours. Solve to find how many hours it takes for the amount of Neptunium-236 to be reduced by half.

5. You put $100 into an account that pays 5% interest compounded monthly. How long will it take for you to have $1,000,000 in the account?
6. You are cooking beef stew. When you take the stew off the stove, it has a temperature of 200F. The room temperature is 70F and the cooling rate of the stew is \( r = 0.054 \). How long (in minutes) will it take to cool the stew to a serving temperature of 100F? (Use Newton’s Law of Cooling)

7. As you are hanging an outdoor thermometer, its reading drops from the indoor temperature of 70F to 35F in one minute. If the cooling rate is \( r = 1.37 \), what is the outdoor temperature?

8. In 1990 an earthquake in Iran was said to have about 6 times the intensity of the 1989 San Francisco earthquake, which had a Richter number of 6.90. What is the Richter number of the Iranian earthquake? Assume \( I_0 \approx 10^{-3} \).

9. Find the Richter number of an earthquake if its intensity is 3,160,000 times as great as the reference intensity. Assume \( I_0 \approx 10^{-3} \).

10. An earthquake in Alaska in 1964 measured 8.50 on the Richter scale. What is the intensity of this earthquake compared with the reference intensity \( I_0 \approx 10^{-3} \)?