Personal Tutors
Chapter 12

Personal Tutor Activity 12.1 — Exponential Growth

1. **Apply** A chemical company has discovered that the use of a specific chemical will increase the number of bacteria present in a sample. The initial number of bacteria present in a sample was 2500 parts per million. The bacteria are increasing at a rate of 5% each day. Use the equation ($y = a(1 + r)^x$) to estimate how many parts per million of the bacteria will be present after five days.

2. **Starting Hint** Write out the equation first, and then write the numbers you know underneath each part.

Personal Tutor Activity 12.2 — Exponential Decay

1. **Apply** A test subject has been taking a specific drug in clinical trials. If the subject takes an initial dose of 10 mg of the drug and the amount of the drug remaining in the subject's system reduces by 26% each hour, how many milligrams of the drug will remain in the system at the end of eight hours? If another dose of the medication can only be administered when the subject has less than 0.01 mg left in his or her system, when would the subject be able to take the next dose? Use the equation ($y = a(1 - r)^x$) to calculate the concentration of the drug in the subject's system.

2. **Starting Hint** Write out the equation first, and then write the numbers you know underneath each part.