Applications of College Algebra

How you will use algebra in your every day life

During this lesson, I present a grab bag of experiences from my life in which I have used mathematical thinking about on par with a college algebra course. The purpose is to demonstrate the usefulness of the subject in everyday life. I have tried to give examples that are applicable to almost everyone and not simply work related. During the lesson we will work out four (time permitting) specific problems. This handout contains those problems.

1. Assuming the bacteria has a doubling time of 20 to 30 minutes, if there were just one (healthy) bacterium in the sample how many would there be after 2 days?

2. A group of scientists are studying the production of insulin by E. coli bacteria. They have found that each E. coli bacterium produces 0.1 units of insulin per hour. The scientists plan to use a culture of E. coli to produce insulin for medical use.

   Assuming that the culture starts with 100 E. coli bacteria and that the growth rate of the E. coli culture is 30% per hour, the scientists want to know how long it will take for the culture to produce 1000 units of insulin per hour.

3. If you have a mortgage with a APR of 3.875% is better to pay down the mortgage (beyond the minimum payment) or save the money? Historically investments accounts can pull in as much as 7-15% APY. In the current economy one can find traditional savings accounts with 4-5% and CD's with even better yields. How would you justify your position?

4. Let's consider a scenario where John wants to purchase a house worth $200,000. He plans to finance the purchase with a 30-year fixed-rate mortgage at an interest rate of 5%. However, the lender offers him an option to buy down the interest rate by paying a certain amount of points. Each point costs 1% of the loan amount and reduces the interest rate by 0.25%.

   The question is whether it is better for John to pay points upfront and lower the interest rate, or to keep the original interest rate, possibly investing the money elsewhere. (This link may be helpful)