

- 1) Tom borrowed \$2,000 from his father and agreed to pay a simple interest rate of 5.5%. After some time had passed, he paid his father \$2,302.50. How long did it take Tom to pay back the loan, including interest?
- 2) Harold will receive a \$3000 income tax refund. For a \$40 fee, her accountant gives her an “interest free” loan for the refund amount. The loan will be due in four weeks. If Harold views the fee as simple interest, what is the simple interest rate of the loan?
- 3) Compute the simple interest  $INT$  for the specified length of time and the future value  $FV$  at the end of that time. Round all answers to the nearest cent.  
\$12,100 is invested for 6 months at 7% per year.
- 4) A \$4,000 loan, taken now, with a simple interest rate of 8% per year, will require a total repayment of \$4,640. When will the loan mature?
- 5) When I was considering what to do with my \$10,000 lottery winnings, my broker suggested that I invest half of it in gold, the value of which was growing by 8% per year, and the other half in certificates of deposit (CDs), which were yielding 4% per year, compounded every 6 months. Assuming that these rates are sustained, how much will my investment be worth in 13 years? (Round your answer to the nearest cent.)
- 6) Determine the amount of money, to the nearest dollar, that you must invest at 9% interest per year, compounded monthly, so that you become a millionaire in 28 years.
- 7) Your pension plan is an annuity with a guaranteed return of 4.5% per year, compounded monthly. You would like to retire with a pension of \$4,000 per month for 25 years. If you work for 30 years before retiring, how much must you and your employer deposit each month into the fund?
- 8) Find the periodic withdrawals  $PMT$  for the given annuity account. Assume end-of-period withdrawals and compounding at the same intervals as withdrawals. Round your answer to the nearest cent.  
\$150,000 at 5%, paid out monthly for 13 years
- 9) You want to set up an education account for your child and would like to have \$75,000 after 17 years. You find an account that pays 5.2% interest, compounded semiannually, and you would like to deposit money in the account every six months. How large must each deposit be in order to reach your goal? Round to the nearest dollar.

- 10) Find the amount accumulated  $FV$  in the given account. Assume end-of-period deposits and compounding at the same intervals as deposits. Round your answer to the nearest cent.

\$350 is deposited monthly for 20 years at 2% per year

- 11) Find the present value  $PV$  of the annuity necessary to fund withdrawals of \$100 per month for 20 years, if the annuity earns 2% per year (assume monthly compounding).
- 12) You own a hamburger franchise and are planning to shut down operations for the day, but you are left with 11 buns, 13 defrosted beef patties, and 7 opened cheese slices. Rather than throw them out, you decide to use them to make burgers that you will sell at a discount. Plain burgers each require 1 beef patty and 1 bun, double cheeseburgers each require 2 beef patties, 1 bun, and 2 slices of cheese, while regular cheeseburgers each require 1 beef patty, 1 bun, and 1 slice of cheese. How many of each should you make?  
**Show all of your work.**
- 13) Urban Community College is planning to offer courses in Finite Math, Applied Calculus, and Computer Methods. Each section of Finite Math has 40 students and earns the college \$40,000 in revenue. Each section of Applied Calculus has 40 students and earns the college \$60,000, while each section of Computer Methods has 10 students and earns the college \$13,000. Assuming the college wishes to offer a total of six sections, accommodate 210 students, and bring in \$253,000 in revenues, how many sections of each course should it offer?  
**Show all of your work.**
- 14) Solve the system of equations without using a calculator. **Show all of your work.**

$$x + y + 6z = 4$$

$$x - y + 2z = 2$$

$$x + 2z = 0$$