

San Jose State University
Department of Mathematics

MATH 70, Practice Midterm 1, Instructor: Plamen Koev

Reference formulas:

$$\text{Simple interest: } A = P(1 + rt) \quad (1)$$

$$\text{Compound interest: } A = P(1 + i)^n, \quad i = r/m \quad (2)$$

$$\text{Continuous compound interest: } A = Pe^{rt} \quad (3)$$

$$\text{Future value of an annuity: } FV = PMT \frac{(1 + i)^n - 1}{i} \quad (4)$$

$$\text{Present value of an annuity: } PV = PMT \frac{1 - (1 + i)^{-n}}{i} \quad (5)$$

Problems:

1. (20 points) An annuity pays 6.55% annual interest rate compounded semiannually. If \$500 is deposited every six months for two years, how much interest is earned?
2. (10 points) The monthly payment on a 2-year loan is \$500. The interest rate is 6.65% compounded monthly. What is the amount of the loan?
3. Compute the inverse of the matrix:

$$\begin{bmatrix} 1 & 1 & 1 \\ -1 & 0 & 3 \\ 2 & 4 & 11 \end{bmatrix}.$$

4. Solve the linear system:

$$x_1 + x_2 + x_3 = 1$$

$$-x_1 + 3x_3 = 1$$

$$2x_1 + 4x_2 + 11x_3 = -1$$