

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. If \$3000 is deposited for 4 months at 4.5% interest, how much interest is earned if it is compounded
 - (a) monthly?
 - (b) continuously?
4. What interest rate, compounded continuously, should a bank pay in order for a \$1000 deposit to turn into \$1200 in 2 years and 3 months?
5. An annuity pays 6.35% compounded quarterly. What should the quarterly payment be in order to have \$200,000 in 15 years?
6. What is the monthly payment on a \$100,000 mortgage at 9% compounded monthly?