

MTH 110
Quiz 3
Summer 2010

Show all work in a neat and organized fashion. Clearly indicate your answers.
25 points possible.

The following formulas may or may not be useful.

Simple interest formulas: $I = Prt$ $A = P(1 + rt)$

Compound interest formulas: $A = P(1 + r)^t$ $A = P\left(1 + \frac{r}{n}\right)^{nt}$

Amortization formulas: $PMT = P\frac{\frac{r}{n}}{1 - \left(1 + \frac{r}{n}\right)^{-nt}}$ $PMT = P\frac{i}{1 - (1 + i)^{-m}}$

1. (3 pts.) The principal P is borrowed and the loan's future value, A , at time t is given. Determine the loan's simple interest rate, r , to the nearest tenth of a percent.

$$P = \$6,000, \quad A = \$6,800, \quad t = 3 \text{ years}$$

2. (3 pts.) Determine the present value, P , you must invest to have the future value, A , at simple interest rate r after time t . Round answers up to the nearest cent.

$$A = \$18,000, \quad r = 8.5\%, \quad t = 9 \text{ months}$$

3. (3 pts.) The principal represents an amount of money deposited in a savings account subject to compound interest at the given rate.

Principal	Rate	Compounded	Time
\$8,500	3.6%	monthly	4 years

(a) Find how much money there will be in the account after the given number of years.

(b) Find the interest earned.

4. (3 pts.) How much money should be deposited today in an account that earns 7.5% compounded quarterly so that it will accumulate to \$25,000 in six years?

5. (3 pts.) Assume that you place money in an account subject to interest compounded annually. Use the formula $A = P(1 + r)^t$, a calculator, and trial and error to answer the following question. Give your answer to the nearest tenth of a year.

How long will it take for the investment to increase by 80% at an interest rate of 6%?

6. (3 pts.) A 25-year-old worker plans to retire at age 70. He believes that \$700,000 is needed to retire comfortably. How much should be deposited now at 6% compounded monthly to meet the \$700,000 retirement goal?

7. (3 pts.) A debt of \$15,000 is to be amortized with 12 equal semiannual payments. If the interest rate is 9%, compounded semiannually, what is the size of each payment?

8. (2 pts.) Express each number in decimal notation.

(a) 8.3×10^{-6}

(b) 4.85×10^8

9. (2 pts.) Express each number in scientific notation.

(a) 78,000

(b) 6300×10^{-7}