Math 140 - Spring 2025 WEEK IN REVIEW #17 - APR. 22, 2025

SECTION 6.1: INTEREST AND EFFECTIVE RATES

Pr 1. You borrowed \$1000 from a quick loan business for 52 days, at a simple interest rate of 42% per year.

What is the interest you will pay on the loan?

Simple interest rate of 42% per year.

$$T = P(t), P = P(incipal)$$

$$C = rate (decimal)$$

$$t = time in Years$$

$$A = P+T$$

$$T = 1000 * .42 * \frac{52}{365}$$

$$T = 559.83$$

Pr 2. Suppose that \$3000 accumulated to \$4529.96 in an investment certificate, compounded weekly. If the

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, solving for t

Pr 4. How long will an investment need to remain in an account with a 2.028% annual interest rate, compounded continuously, in order for the investment to increase by 50%?

investment
$$A = P + .5P$$

$$A = 1.5P$$

$$A = 1.$$

· effective interest rates annual percentage yield ${f Pr}$ 5. Consider the following three accounts: A - interest rate 3.26%, compounded quarterly you put one dollar If B - interest rate 3.25%, compounded weekly into account, APY is C - interest rate 3.24%, compounded continuously. (a) Compute the effective interest rates for each of these accounts the total interest after a year. A- interest rate 3.26%, n=4 calc = Eff (3.26, 4) = 3.3000 % B - & Eff (3.25, 52) = 3.3023% B C- effective interest rate Pert P(1. [11t]) [e = e[-1] - | = -032930 3.293% ((b) Which account is the best one to use for investing? B, because it has the highest effective interest rate.

SECTION 6.2: ANNUITIES, SINKING FUNDS, AND AMORTIZATION

Pr 1. You have just given birth to a child. You decide to save up for their college education. You make an initial deposit of \$2000 into an account that earns 2.4 % interest, compounded monthly. You also put \$500 per month into the account. How much will be in the account after 18 years?

Extra- Total amount we put into account?

500 x 216 + 2000

= 110,000

Extra- Total interest = FV - Total paid

~ 27,997.02

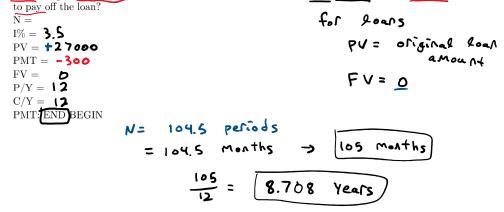
Pr 2. You have just started your career. Your goal is to have one million dollars in your savings account when you retire 30 years from now. Your savings account earns 1.2% interest, compounded monthly. How much do you need to put into the account each month to reach your retirement goals?

N = 360 I% = 1.2 PV = 0 PMT = FV = 1000000 P/Y = 12 C/Y = 12 PMT : END BEGIN

PMT = \$ 2309.08

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Pr 3. You borrowed \$27,000 in subsidized loans to pay tuition for four years of college. Now that you have been out of college for a year, your loan company is going to start charging annual interest at a rate of 3.5%, compounded monthly. You find that you can afford to pay \$300 per month. How long will it take



Pr 4. Congratulations, you won 10 million in the lottery. The lottery gives you 30 annual payments. Suppose that the account has a 2.7% annual interest, compounded monthly. How much money will the lottery give you if you choose to take the lump sum instead?

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Pr 5. Ten years ago, we decided to buy a house for $280,000. To avoid having to pay mortgage insurance, we
               decided to make a 20\% down payment. We took out a 30-year loan for the rest. The loan charges 4.6\%
               interest, compounded monthly.
                                                           problem involving down
                (a) How much was the original amount of the loan?
                                                                                Payment.
                                 common answer = 280,000 < wrong
                                  loan Amount = Purchase Price
                                                      = Purchasex (1-1%)
                              280000 (1-.2) = .8 (280000)
                                     = $224000
                (b) How much have we paid in interest on the loan so far?
                                                           110
                                                                 years have
                                                                 passed)
                   Solve
                            (c) first
                                       Total paid = 1148.32 x 120
                       Total paid - 280000
                (c) What is the outstanding principal on the loan? (outstanding balance)
                                              amount we still owe
            Solve
                                ch 1: Solve for "FV"

- number of periods so far = 10x12=120
                                                                               Approach 2: Solve
                      Approach 1.
Preliminary work:
                                                                                    for Pu
   N= 30 x 12
                          I = 4.6
   I=46
                          PV = 224000
   PU = 224000
   PMT= ? -1148.32 -> PMT= 2 -1148.32
                          FV= 3
                         P/Y = 12
                                                                                       = 20 x (2
  P/Y = C/Y=12
                                                                                       = 240
                         UY = 12
                         F U= 179, 971.05
                                     outstanding Balance = $179,971.05
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Ten years ago, we decided to buy a house for \$280,000. To avoid having to pay mortgage insurance, we decided to make a 20% down payment. We took out a 30-year loan for the rest. The loan charges 4.6% interest, compounded monthly.

(d) What is the <u>current equity</u> for the house?

much value is in the house = Purchase Price - out stranding balance

2 \$0 000 - 179 971.05 (= \$100,028.95)

(e) How much of the first payment went towards interest, and how $\underline{\underline{\mathbf{m}}}$ uch went towards the principal?

first Payment= 1148.32

First interest charge = Profil

ith interest amount = $P_{int} \cdot \frac{\Gamma}{\Gamma}$. 224000 x $\frac{.046}{12} = 858.67 towards interest

1148.32

amount towards principal

= \$289.65

You can use the TVM solver to solve For similar questions