FRM

# Math 1030 #10b

ARM

## Loans, Credit Cards and Mortgages

## Credit Cards

Installment Loan

Payday Loan

Credit Cards

EX 1: You have $4000 of credit card debt that you would like to pay off in the next 3 years. You will not make any additional charges on your card during that time. The APR on your card is 21%.

$$P = 4000, \quad APR = 0.21, \quad n = 12, \quad Y = 3$$

a) What will your monthly payments be?

$$PMT = \frac{P \cdot \left( \frac{APR}{n} \right)}{\left[ 1 - \left( 1 + \frac{APR}{n} \right)^{(-nY)} \right]}$$

$$PMT = \frac{4000 \left( \frac{0.21}{12} \right)}{1 - \left( 1 + \frac{0.21}{12} \right)^{-12(3)}} \approx \$150.70$$

b) How much will you pay during those 3 years?

$$\text{total payments} = 150.70 \, (12)(3) = \$5425.20$$

c) What is the overall percentage you paid in interest?

$$\frac{5425.20 - 4000}{4000} = \frac{1425.20}{4000} \approx 35.6\%$$

EX 2: If you put $3000 on a credit card with 21% interest rate at age 20 and just make minimum payments of $60 each month, how much will you still owe at age 25?

$$PMT = 60, \quad n = 12, \quad Y = 5,$$
$$APR = 0.21$$

$$PMT = \frac{P \cdot \left(\frac{APR}{n}\right)}{\left[1 - \left(1 + \frac{APR}{n}\right)^{(-nY)}\right]}$$

$$60 = \frac{P\left(\frac{0.21}{12}\right)}{1 - \left(1 + \frac{0.21}{12}\right)^{-12(5)}}$$

$$0.0175 = \frac{0.21}{12}$$

$$\frac{60\left(1 - 1.0175^{-60}\right)}{0.0175} = P \implies P \approx \underbrace{\$2217.84}_{\text{pay off this amt.}}$$

Still owe $3000 - 2217.84$
$$= \$782.16$$
total paid $= 60(12)(5) = \$3600$