

5.4 Amortization Schedules

Shrinking Interest
Payments

Skill 2

- PREPAYMENT FORMULA

$$A = \frac{M[1 - (1 + r)^{-q}]}{r}$$

- Where r
 - M= monthly payment
 - r = **monthly** interest rate
 - q = number of remaining payment periods
 - A = prepayment amount

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Skill 2

- You want to prepay your car loan. You have been making monthly payments of \$380.43 on a 4 yr loan of \$15,000 at 10% interest.
- How much will you owe if you prepay 12 months early?

$$A = \frac{M[1 - (1 + r)^{-q}]}{r}$$

Skill 2

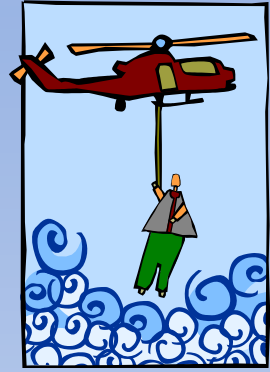
- You want to prepay your car loan. You have been making monthly payments of \$380.43 on a 4 yr loan of \$15,000 at 10% interest.
- How much will you owe if you prepay 12 months early?

$$A = \frac{380.43 * [1 - (1 + (.10/12))^{-12}]}{(.10/12)}$$

- A = \$4327.20



Skill 2



- How much will you save by prepaying?
 - If you do not prepay the loan you will pay the monthly payment for the remaining 12 months
 - $(380.43) * 12 = \$4565.16$
 - So subtract the prepayment amount from the amount you would have paid had you not prepaid.
 - $4565.16 - 4327.20 = \$237.96$
 - **You saved \$237.96.**

Rule of 78


- The buyer pays a portion of the yearly interest
 - portion of interest equal to:
 - 12/78 in month 1
 - 11/78 in month 2
 -
 -
 - 1/78 in month 12

Skill 3: RULE OF 78



- We purchased a new XBOX 360 4GB Console with Kinect for \$299.99, and we put \$99.99 dollars down. We signed an agreement stating that the balance was to be paid in 12 equal installments with an interest rate of 24% per year.
- We want to prepay and the Microsoft Company is going to apply the Rule of 78.
- How much interest will we save?

Skill 3: RULE OF 78

- What is our balance after our down payment of \$99.99?
- $299.99 - 99.99 = \$200$
- Find the yearly 
- $.24 * 200 = \$48.00$



Skill 3: RULE OF 78

- We are going to prepay with 6 remaining payments

- Apply the Rule of 78

$$\begin{aligned} &= \frac{6}{78} + \frac{5}{78} + \frac{4}{78} + \frac{3}{78} + \frac{2}{78} + \frac{1}{78} \\ &= \frac{21}{78} \end{aligned}$$





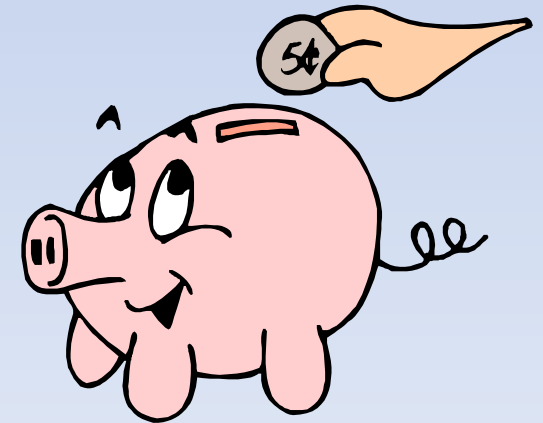
Skill 3: RULE OF 78

- Apply the Rule of 78

$$\begin{aligned} &= \frac{6}{78} + \frac{5}{78} + \frac{4}{78} + \frac{3}{78} + \frac{2}{78} + \frac{1}{78} \\ &= \frac{21}{78} \end{aligned}$$

- $21/78 * 48 = \$12.92$

We would save \$12.92.



Ask Yourself pg 218

- **What does an amortization schedule show?**
 - The interest portion of monthly loan payments

Ask Yourself pg 218

- Why do most loan contracts require the borrower to pay more interest in the early months of the loan period?
 - The early months are when the lender's risk are greater

Ask Yourself pg 218

- Do you think that you will save money if you prepay a loan?

–It depends upon the amount of any prepayment penalty

Ask Yourself pg 218

- Do you think that it is fair for a bank to charge a prepayment penalty?

Assignment

- Page 223
 - TYS #1-7
- Page 224
 - EYS #1,4-9, 16-22 EVEN
- Page 225
 - MR #1,6-10