2-10
The Term of a Systematic Account

You will need:

- Student Notes
- Textbook
- Calculator
- Notebook Paper
- Pen or Pencil

Red Items are needed during the lecture

OBJECTIVES

Calculate the term of systematic savings.

Calculate the term of a systematic withdrawal.

Planning for your financial future

- How long can I make withdrawals before running out of money?
- Today we will learn how to answer this question.

Present Value of a Systematic Withdrawal

$$P = W \bullet \frac{1 - \left(1 + \frac{r}{n}\right)^{-nt}}{\frac{r}{n}}$$

P = principal (present value)

W = periodic withdrawal amount

r = annual interest rate (converted)

n = number of times interest is compounded annually

t = length of investment in years

Example 4

Laura and Rich deposited $100,000 into an annuity account that compounds interest monthly at a rate of 1.08%. Each month, they withdraw $500 from the account. How long will it take them until the account has a balance of $0?

Which formula on the formula cheat sheet? **5**

Q1) One or multiple? Multiple: Middle

Q2) Which key word? Withdrawals: 5

Q3) What are you looking for? Time

Example 4

Laura and Rich deposited $100,000 into an annuity account that compounds interest monthly at a rate of 1.08%. Each month, they withdraw $500 from the account. How long will it take them until the account has a balance of $0?

$$P = W \bullet \frac{1-\left(1+\frac{r}{n}\right)^{-nt}}{\frac{r}{n}}$$

Determine the variables:

P = principal 100,000.00

W = periodic withdrawal amount 500.00

r = annual interest rate (converted) .0108

n = number of times interest is compounded annually 12

t = length of investment in years t

Example 4

Laura and Rich deposited $100,000 into an annuity account that compounds interest monthly at a rate of 1.08%. Each month, they withdraw $500 from the account. How long will it take them until the account has a balance of $0?

$$100000 = 500 \bullet \frac{1-\left(1+\frac{.0108}{12}\right)^{-12t}}{\frac{.0108}{12}}$$

Determine the variables:

P = principal 100,000.00

W = periodic withdrawal amount 500.00

r = annual interest rate (converted) .0108

n = number of times interest is compounded annually 12

t = length of investment in years t

$t = 18.4$

It will take 18.4 years to empty out the account.

Example 4 – You try it!

Rameen deposited $40,000 into an account that compounds interest at a rate of 0.96% monthly. She has set up a direct withdrawal of $256 every month to pay off her student loan. She has a 15-year loan. Will she have enough money in the account to cover all of the required loan payments?

Example 4 – You try it!

Rameen deposited $40,000 into an account that compounds interest at a rate of 0.96% monthly. She has set up a direct withdrawal of $256 every month to pay off her student loan. She has a 15-year loan. Will she have enough money in the account to cover all of the required loan payments?

Determine the variables:

$$P = W \bullet \frac{1-\left(1+\frac{r}{n}\right)^{-nt}}{\frac{r}{n}}$$

P = principal 40000

W = periodic withdrawal amount 256.00

r = annual interest rate (converted) .0096

n = number of times interest is compounded annually 12

t = length of investment in years t

Example 4 – You try it!

Rameen deposited $40,000 into an account that compounds interest at a rate of 0.96% monthly. She has set up a direct withdrawal of $256 every month to pay off her student loan. She has a 15-year loan. Will she have enough money in the account to cover all of the required loan payments?

Determine the variables:

$$40000 = 256 \bullet \frac{1-\left(1+\frac{.0096}{12}\right)^{-12t}}{\frac{.0096}{12}}$$

P = principal 40000

W = periodic withdrawal amount 256.00

r = annual interest rate (converted) .0096

n = number of times interest is compounded annually 12

t = length of investment in years t

Example 4 – You try it!

Rameen deposited $40,000 into an account that compounds interest at a rate of 0.96% monthly. She has set up a direct withdrawal of $256 every month to pay off her student loan. She has a 15-year loan. Will she have enough money in the account to cover all of the required loan payments?

$$40000 = 256 \bullet \frac{1-\left(1+\frac{.0096}{12}\right)^{-12t}}{\frac{.0096}{12}}$$

$t = 13.9$

It will take 13.9 years to empty out the account. Does that answer the question? ***No***

No – *The account will not cover the end of the loan.*

Please work on you assignment.
It is due at the end of next class.

Grade goes here	Read Pg: 129 to 135 Do Pg 137: #8-11, 14, 15 Pg 145: 14, 16, 17, 20-22	Last First P__ A:**2-10**