

2-3

SAVINGS ACCOUNTS

OBJECTIVES

You will need:

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

Red Items are needed during the lecture

Understand the advantages & disadvantages of an interest bearing account. (Interest bearing means it pays interest.)

Compute simple interest.

Compute doubling time.

Banking

- What banking services do you use besides a checking account?
- What are the advantages of a savings account?
 - Convenience of not carrying cash
 - Interest is a source of income
- What are the disadvantages of a savings account?
 - Not easy to get your money

Example 2

- Grace wants to deposit \$5,000 in a certificate of deposit for a period of two years.
- She is comparing interest rates quoted by three local banks and one online bank.

First State Bank: $1\frac{1}{4}\%$

E-Save Bank: $1\frac{3}{8}\%$

Johnson City Trust: .0122

Land Savings Bank: 1.3%

Which bank will pay the most interest income?

Let's convert each rate into a decimal %

First State Bank: $1\frac{1}{4}\%$	E-Save Bank: $1\frac{3}{8}\%$
Johnson City Trust: .0122	Land Savings Bank: 1.3%

Let's convert each rate into a decimal %

First State: $1\frac{1}{4}\%$	$\frac{1}{4} = .25$	1.25%
E-Save Bank: $1\frac{3}{8}\%$	$\frac{3}{8} = .375$	1.375%
Johnson: .0122	multiply by 100%	1.22%
Land: no change needed		1.3%

Which bank will pay the most interest income?
E-Save Bank

First State Bank: $1\frac{1}{4}\%$	E-Save Bank: $1\frac{3}{8}\%$
Johnson City Trust: .0122	Land Savings Bank: 1.3%

Let's convert each rate into a decimal %

First State: $1\frac{1}{4}\%$	$\frac{1}{4} = .25$	1.250%
E-Save Bank: $1\frac{3}{8}\%$	$\frac{3}{8} = .375$	1.375%
Johnson: .0122	multiply by 100%	1.220%
Land: no change needed		1.300%

Which bank will pay the most interest income?
E-Save Bank

Example 2 – Now You Try It!

Write the following five interest rates in descending order (greatest to least). Then decide which interest rate you would prefer. Why?

5.51%, $5\frac{1}{2}\%$, $5\frac{5}{8}\%$, .05099, 5.6%

↓ ↓ ↓ ↓ ↓
5.51% 5.5% 5.625% 5.099% 5.6%

In order: 5.625%, 5.6%, 5.51%, 5.5%, 5.099%

Prefer: 5.625%

Why: It gives you the most interest income

- Raoul's savings account has a minimum balance requirement of \$500.
- If it falls below \$500, he is charged a \$4 fee.
- His balance is \$716.23.
- He withdraws \$225.

What was his new balance?

$$\begin{aligned}\text{New Balance} &= \text{Prior Balance} - \text{Reduction} \\ &= 716.23 - 225 \\ &= 491.23\end{aligned}$$

Will he be charged a fee? Yes

$$\begin{aligned}\text{New Balance} &= \text{Prior Balance} - \text{Reduction} \\ &= 491.23 - 4 \\ &= \mathbf{487.23}\end{aligned}$$

Example 3 – Now You Try It!

- Mae has \$891 in her account.
- A \$7 fee is charged each month the balance is below \$750.
- She withdraws \$315.

What is her new balance?

$$\begin{aligned}\text{New Balance} &= \text{Prior Balance} - \text{Reduction} \\ &= 891 - 315 \\ &= 576\end{aligned}$$

Will she be charged a fee? Yes

$$\begin{aligned}\text{New Balance} &= \text{Prior Balance} - \text{Reduction} \\ &= 576 - 7 \\ &= \mathbf{569}\end{aligned}$$

New Formula

Simple Interest formulas:

$$\boxed{1a} \quad I = PRT \quad \text{and} \quad \boxed{1b} \quad B = P + PRT$$

I = Amount of Interest Earned

B = Ending Balance

P = Principal (beginning amount)

R = Interest **Rate** (converted)

T = Time in years

Look at your Formula Cheat Sheet.

Where are these formulas?

What are their numbers?

- Mitchell deposits \$1,200 in an account **Example 4** that pays 1.5% simple interest.
- He keeps the money in the account for three years without any deposits or withdrawals.

How much is in the account after three years?

Step 1: Determine which formula to use by asking:

What do I want to know? **Ending Balance**

Which formula will give us that information? **1b**

Example 4

- Mitchell deposits \$1,200 in an account that pays 1.5% simple interest.
- He keeps the money in the account for three years without any deposits or withdrawals.

How much is in the account after three years?

Step 2: Plug into formula and solve

$$\begin{aligned} B &= P + P \times R \times T \\ &= 1,200 + 1,200 \times .015 \times 3 \\ &= \mathbf{\$1,254} \end{aligned}$$

Example 4 - **Now You Try It!**

How much simple interest is earned on \$4,000 in $3\frac{1}{2}$ years at an interest rate of 1.2%?

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How much simple interest is earned on \$4,000 in $3\frac{1}{2}$ years at an interest rate of 1.2%?

Step 1: Determine which formula to use by asking:
What do I want to know? **Amount of Interest**

Which formula will give us that information? **1a**

Example 4 - **Now You Try It!**

How much simple interest is earned on \$4,000 in $3\frac{1}{2}$ years at an interest rate of 1.2%?

Step 2: Plug into formula and solve

$$I = PRT$$

$$I = 4,000 \times .012 \times 3.5$$

$$\text{Interest} = \mathbf{\$168}$$

Example 6

How much principal must be deposited to earn \$1,000 simple interest in 2 years at a rate of 1.3%? Round to the nearest cent.

Step 1: Determine which formula to use by asking:
What do I want to know? **Principal**

Which formula will give us that information?

Both – So how do you choose?

Do you have all of the information needed to use 1A?

Yes!

Example 6

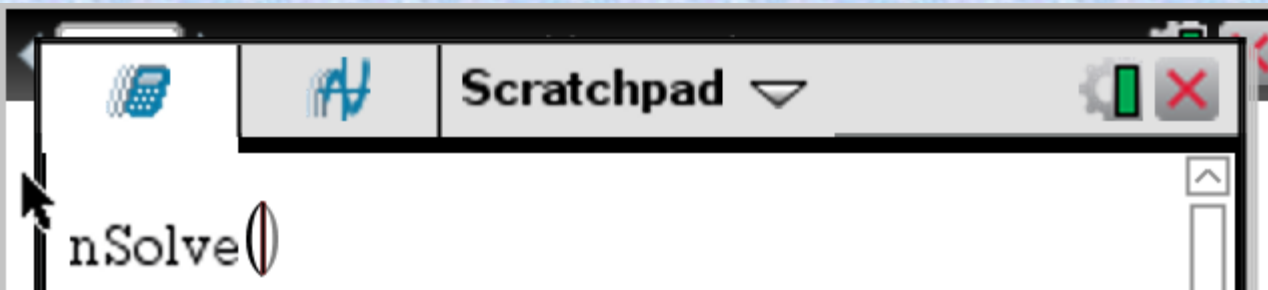
How much principal must be deposited to earn \$1,000 simple interest in 2 years at a rate of 1.3%? Round to the nearest cent.

$$I = PRT$$

$$1,000 = P \times .013 \times 2$$

Menu, 3, 1

$$P = \mathbf{\$38,461.54}$$



```
nSolve(1000=p·0.013·2,p)
```

```
38461.5384615
```


Example 6 - **Now You Try It!**

How much principal must be deposited in a two-year simple interest account that pays 1.75% interest to earn \$300 in interest?

$$I = PRT$$

$$300 = P \times .0175 \times 2$$

Menu, 3, 1

$$P = \mathbf{\$8,571.43}$$

Example 6 - **Now You Try It!**

How much principal must be deposited in a two-year simple interest account that pays 1.75% interest to earn \$300 in interest?

$$I = PRT$$

$$300 = P \times .0175 \times 2$$

$$\text{Menu, 3, 1}$$

$$P = \mathbf{\$8,571.43}$$

- Derek has a bank account that pays 2.1% simple interest.
- The balance is \$750.

When will the account balance double?

Step 1: Determine which formula to use by asking:
What do I want to know?

Time

Which formula will give us that information?

Both – So how do you choose?

Do you have all of the information needed to use 1A?

Yes!

Example 7

- Derek has a bank account that pays 2.1% simple interest.
- The balance is \$750.

When will the account balance double?

$$I = PRT$$

$$1,500 = 750 \times .021 \times T$$

Menu, 3, 1

$$T = \mathbf{47.62 \text{ years}}$$

Example 7 - Now You Try It!

How long will it take \$10,000 to double at 11% simple interest?

Example 7 - **Now You Try It!**

How long will it take \$10,000 to double at 11% simple interest?

$$B = P + PRT$$

$$20,000 = 10,000 + 10,000 \times .11 \times T$$

Menu, 3, 1

$$T = \mathbf{9.1 \text{ years}}$$

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

Grade goes here	Read Pg: 81 to 86 Do Pg 87: #3,5,7,9,11-16,(skip 11h), 18-20	Last First P__ A:2-3