

How to use this text

This is a text designed for students to *work* through on their own, at their own pace, without lecture!

This is a workbook that has business mathematics theory embedded into the practical work-through questions where it seems to be “obvious”, rather than the typical introduction section which discusses abstract ideas that you will eventually get to see and do. This approach is considered “minimalist” and has proven to be highly effective over my 24 years of teaching. The more meaningful questions a student works through, the deeper their understanding and the student who works through practical problems first will encounter all of the ideas that would have normally been discussed (abstractly) in an introduction but will have a significantly deeper appreciation of the same material! There is an incredible efficiency in “getting underway” with practical problems immediately. You will be continually surprised at how much material a student can successfully digest in a regular class period when freed up to investigate interesting problems by themselves.

The problems posed are ones that each of us encounter in day to day life; student loans, renting vs. owning, credit card charges, mortgages, car payments, purchasing furniture on time, saving for your or your child’s college fund, etc. The flow of the text is one that hopefully fosters curiosity and the understanding of money, interest and time.

The instructors “job” is to answer all questions and, if necessary, give mini lectures or hold discussion sessions – in other words, “the clean up crew”. Often an entire lecture can be reduced to a sentence when presented at the “right” time – when the student has done the work necessary and is now “ready”.

1-Simple Interest: Interest on the original principal

$$I = Prt$$

P = Principal borrowed or invested
r = rate of interest (typically annual)
t = time that money is borrowed or invested (typically annual)

ON the **SHARP**
Business/Financial
calculator:
2nd F, TAB, 4 (gives
four decimal places).
2nd F, TAB, 3 (gives
three decimal places).
2nd F, TAB, 2 (gives
two decimal places).

Example 1.1

What is the interest paid on \$1,000.00 in a savings account at 3% for 5 years?

I = Prt (substitute the values given in the question into the equation)

$$I = \$1,000.00 \times 0.03 \times 5$$

$$I = \$150.00$$

Example 1.2

What is the interest paid on \$1,000.00 in a savings account at 3% for 5 months?

I = Prt

I = \$1,000.00 x 0.03 x 5/12 (time must be in years, fractional years or decimal years to match interest).

$$I = \$12.50$$

Example 1.3

What is the interest paid on \$1,000.00 in a savings account at 3% for 3 months? (**You fill out**) (\$7.50)

I = Prt =

I =

Example 1.4

What is the interest paid on \$1,000.00 in a savings account at 3% for 5 weeks?

I = Prt

I = \$1,000.00 x 0.03 x 5/52 (time must be in years, fractional years or decimal years to match interest).

$$I = \$2.89$$

Example 1.5

What is the interest paid on \$1,000.00 in a savings account at 3% for 15 weeks? (**You fill out**) (\$8.65)

I = Prt =

I =

Example 1.6

What is the interest paid on \$1,000.00 in a savings account at 3% for 5 days?

I = Prt

I = \$1,000.00 x 0.03 x 5/365 (time must be in years, fractional years or decimal years).

$$I = \$0.41 \quad (\text{rounded to nearest cent}).$$

Example 1.7

What is the interest paid on \$1,000.00 in a savings account at 3% for 235 days? (**You fill out**) (\$19.32)

I = Prt

I =

I =

Example 1.8

How long will it take \$1,000.00 to earn \$50 simple interest at 4%? Calculate for years, months, weeks, and days.

$$I = Prt$$

$$I / Pr = Prt / Pr \quad (\text{dividing both sides by Pr})$$

$$I / Pr = t \quad (\text{Pr divided Pr equals 1})$$

$$\$50.00 / (\$1000.00 \times 0.04) = t \quad (\text{parentheses are essential here or what would happen?})$$

$$\$50.00 / \$40 = t$$

$$1.25 \text{ years} = t \text{ OR}$$

$$1.25 \text{ years} \times 12 \text{ months/year} = 15 \text{ months OR}$$

$$1.25 \text{ years} \times 52 \text{ weeks/year} = 65 \text{ weeks OR}$$

$$1.25 \text{ years} \times 365 \text{ days/year} = 456.25 \text{ days}$$

Example 1.9

How long will it take \$1,000.00 to earn \$25 simple interest at 8.25%? Calculate for years, months, weeks, and days. (0.30 years, 3.64 months, 15.60 weeks, 109.50 days)

$$I = Prt$$

Example 1.10

What rate of interest is in effect if you earn \$100.00 simple interest on \$5,000.00 for 180 days?

$$I = Prt \quad (\text{Divide both sides by Pt})$$

$$I / Pt = Prt / Pt \quad (\text{Pt / Pt} = 1)$$

$$I / Pt = r$$

$$\$100.00 / (\$5,000.00 \times 180/365) = r \quad (\text{parentheses are essential here – or what happens?})$$

$$0.040556 = r$$

$$4.06\% = r$$

Example 1.11

What rate of interest is in effect if you earn \$100.00 simple interest on \$5,000.00 for 270 days? (0.027)

$$I = Prt$$

Exercises

1. How much simple interest (\$) will be earned on \$500.00 in 4 years if the interest rate is 4.5%? (\$90)
2. Overdue accounts are regularly charged interest. What will be the simple interest (\$) on a \$4,500.00 account if rates are 5.5% and the account is 28 days overdue? (\$18.99)
3. How much money would you have to deposit into a six-month term deposit earning 4.7% simple interest to earn \$350.00 interest? (\$14,893.62)
4. If you had an account three months overdue and were charged \$250.00 on a \$5,900.00 invoice, what rate of simple interest were you charged? (16.95%)
5. If you are pay \$225.00 interest on a \$7,500.00 loan at 6.5% simple interest, how long did you borrow the money for (in years and months)? (0.4615 years, 5.5385 months)
6. A three month term deposit pays \$27.50 interest on a \$5,000.00 deposit. What is the rate of simple interest? (2.20%)
7. $P = \$250.00$, $r = 7.5\%$ simple interest, $t = 16$ months, $I = ?$ (\$25.00)