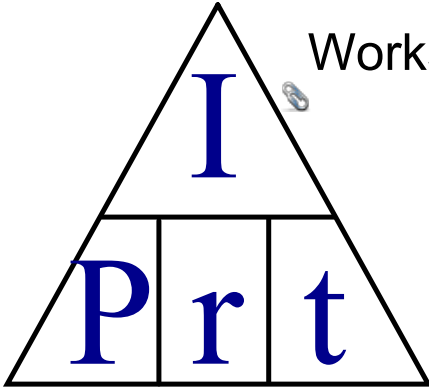


PRACTICE rearranging... $I = Prt$



Worksheet - Rearranging Simple Interest.pdf

When finished...PRACTICE rate of return (ROR)

Text p. 452: #3 & #12

3. a) Principal of \$1000 is invested at 5% simple interest, paid annually, for 5 years. What is the rate of return?
 b) Which option below would yield the greatest future value? What is the rate of return for this option?

$$ROR = \frac{I}{P} \times 100\%$$

- A. increasing the principal to \$1050
- B. increasing the interest rate to 6%
- C. paying interest every 6 months
- D. increasing the term to 6 years

← no change

a) $I = 1000(0.05)(5)$
 $I = \$250$

$$ROR = \frac{250}{1000} \times 100\% = 25\%$$

b)

3)	$1050(.05)(5)$	262.5
a)	$1000(0.06)(5)$	300
d)	$1000(0.05)(6)$	300

$$ROR = \frac{300}{1000} \times 100\% = 30\%$$

12. Lin invested \$4700. After 8 years, the investment's value was \$9400.

- a) What was the annual simple interest rate?
- b) Suppose that the interest rate continued for another 8 years. What would be the value of the investment?



$$\begin{aligned}
 a) \quad r &= \frac{I}{Pt} \\
 &= \frac{4700}{4700(8)} \\
 &= 2.5\%
 \end{aligned}$$

$$\begin{aligned}
 b) \quad A &= P + Prt \\
 &= 4700 + 4700(0.025)(16) \\
 &= \$14100
 \end{aligned}$$

$$\begin{aligned}
 I &= A - P \\
 &= 9400 - 4700 \\
 &= 4700
 \end{aligned}$$

\$\$\$ Questions...great website for answers!!!

The screenshot shows the homepage of GetSmarterAboutMoney.ca. At the top, there are navigation links for 'GetSmarter AboutMoney.ca', 'GetSmarter AboutMoney.ca Blog', 'Inspire FinancialLearning.ca', and 'GetSmarter WithFunnyMoney.ca'. On the right, there are logos for 'INVESTOR EDUCATION FUND' and 'OSC' (Ontario Securities Commission), with the text 'An Ontario Securities Commission initiative' below them. Social media icons for Pinterest, LinkedIn, Twitter, YouTube, Facebook, and RSS are also present. The main header features the site's name 'GetSmarterAboutMoney.ca' and the tagline 'Answers to your money questions.' Below this is a search bar and a 'Français' link. A navigation menu includes 'Home', 'Investing', 'Planning', 'Life events', 'Tools & Calculators', 'Research', and 'About IEF'. The main content area has a dark background with a cartoon character pointing to the text 'help your teen put mind over money.' and 'Play the NEW DOLLAR DECISIONS\$'. A 'BACK TO SCHOOL 2013' badge is on the left. On the right, there is a list of topics: 'Money and families', 'A real estate reality check', 'Calculate it: RESPs', 'Freshman finances', and 'Dollar Decision\$ for teens'. A blue box in the top right corner says 'Improve the site - take our survey.'

8.3

Compound Interest: Future Value

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

GOAL

Determine the future value of an investment that earns compound interest.

Terminology T

Click on the picture to verify the match.

daily

bi-weekly

semi-annually

weekly

monthly

quarterly

annually

once a year

ear year

26 times a year

52 times a year

365 times a year

COMPOUND Interest

Interest is added to the principal periodically throughout the year. New interest may be paid on the principal plus the interest. The interest rate is stated per annum and is divided by the number of **compounding periods**.

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

$$I = A - P$$

A = final value of the investment ...(principal + interest)

P = principal

r = annual interest rate

n = number of compounding periods in a year

t = term of the investment or loan in number of years

EXAMPLE #1: If \$1000 is invested at 8 %/a compounded semi-annually for 2 years, how much will the investment be worth?

Using the simple interest formula...

$$I = 1000(0.08)(6/12)$$

$$= \$40 \text{ (after 1st interest period)}$$

$$\text{New principal} = 1000 + 40$$

$$= \$1040$$

$$I = 1040(0.08)(6/12)$$

$$= \$41.60 \text{ (after 2nd interest period)}$$

$$\text{New Principal} = 1040 + 41.60$$

$$= \$1081.60$$

$$I = 1081.60(0.08)(6/12)$$

$$= \$43.26 \text{ (after 3rd interest period)}$$

$$\text{New Principal} = 1081.60 + 43.26$$

$$= \$1124.86$$

$$I = 1124.86(0.08)(6/12)$$

$$= \$44.99 \text{ (after 4th interest period)}$$

$$\text{New Principal} = 1124.86 + 44.99$$

$$= \$1169.85$$

Compound Interest

```
1000(1+0.08/2)^4
1169.85856
```

Compound Interest Formula...

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

**SAME
ANSWER?**

EXAMPLE #2:

Calculate the final value of an initial investment of \$6000.00. Interest is paid at 4% per annum, compounded semi-annually, for three years.

A = final value of the investment ...(principal + interest)
P = principal
r = annual interest rate
n = number of compounding periods in a year
t = term of the investment or loan in number of years

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$
$$A = 6000 \left(1 + \frac{0.04}{2}\right)^{(2)(3)}$$

$6000(1+0.04/2)^6$ 6756.974516

EX #3: Mr. Hallihan invests \$59 000 at 4.5% /a compounded quarterly for 23 years. Determine...

- a) How much will this investment be worth?
- b) How much interest did you earn?

a)

```
59000(1+0.045/4)
^92
165134.2646
```

b)

$$I = A - P$$

```
59000(1+0.045/4)
^92
165134.2646
Ans-59000
106134.2646
```


EXAMPLE #4...

A keen MVHS student wants to save some money from their summer employment. They decide to take out a Canada Savings Bond which pays 2.5 % interest per year compounded monthly. If the student invests \$850 into the bond, how much interest will they earn if they don't touch the money for 3 years?

$$A = 850(1 + 0.025/12)^{36}$$

916.1300521
Ans-850
66.13005205
I =

HOMEWORK...

p. 457: #1, 2

p. 468: #2, 6, 7

Simple

$$I = Prt$$

&

$$A = P + I$$

$$A = P + Prt$$


$$A = P(1 + rt)$$


Compound

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

$$I = A - P$$

Practice With Compound Interest...

 Worksheet - Introduction to Compound Interest.doc

 Worksheet Solutions - Compound Interest.pdf

Attachments

Worksheet - Rearranging Simple Interest.pdf

Worksheet - Simple Interest.pdf

Worksheet - Introduction to Compound Interest.doc

Worksheet Solutions - Compound Interest.pdf