HOMEWORK... ~~2~~, 36, 11

Questions

p. 452: #1 - 6, 10, 11

Graph

$I = Prt$

&

$A = P + I$

OR

Found

$A = P + Prt$

$A = P(1 + rt)$

2. Cam has $5000 to invest. He wants his principal to grow to $6500 in 5 years so that he can afford a new drum kit.
   a) What simple interest rate will allow him to meet his goal?
   b) Suppose that interest is paid semi-annually and Cam withdraws all the money after 3.25 years. How much money will he have?

+1500 Interest

$I = Prt$

$A = P + I$

$A - P = I$

a) $\frac{I}{Pt} = \frac{Prt}{Pt}$

$r = \frac{I}{Pt}$

$r = \frac{1500}{5000(5)} \times 100\%$

$r = 6\%$

$t = 3.25$ yrs

b) $A = P + Prt$

$A = 5000 + 5000(0.06)(3)$

$A = \$5900$

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?

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

* After Today

11. A bank is offering a simple interest rate of 3.2% for a guaranteed investment certificate with a 5-year term.
    a) What principal would you need to invest if you wanted to have $20 000 at the end of the term?
    b) How long would it take for the value of the GIC to be $25 000?

$I = Prt$ ✗

$A = P + I$ ✗

$A = P + Prt$

OR NICE ☺

$A = P(1 + rt)$

$P = \frac{I}{rt}$

$P = \frac{A}{(1 + rt)}$

$= \frac{20000}{(1 + 0.032 \times 5)}$

$= \$17\,241.38$

b) $t = \frac{I}{Pr}$ years

$t = \frac{7758.62}{17241.38(0.032)}$

$t = 14.1$ years

Happy!

rate of return

The ratio of money earned (or lost) on an investment relative to the amount of money invested, usually expressed as a decimal or a percent.

$$ROR = \frac{earn / lost}{invested}$$

Interest / Principal

a) $t = \frac{I}{Pr}$

$= \frac{3000}{5000 \times 0.08}$

7.5 years

8 years

EXAMPLE 3 p. 448 Determining the duration of a simple interest investment

Ingrid invested her summer earnings of $5000 at 8% simple interest, paid annually. She intends to use the money in a few years to take a holiday with a girlfriend.

a) How long will it take for the future value of the investment to grow to $8000?

b) What is Ingrid's **rate of return**?

$I = 5000(0.08)(8)$

$I = 3200$

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

$= \frac{3200}{5000} \times 100\%$

$ROR = 64\%$

Ingrid's Solution

a) $A = P + Prt$

P is \$5000.
r is 8%, or 0.08.
A is \$8000.

$8000 = 5000 + (5000)(0.08)t$
$3000 = 400t$
$7.5 = t$

I knew P, r, and A. I determined t by substituting these known values into the formula $A = P + Prt$ and solving for t.

Because I needed to isolate t, I knew that the $A = P + Prt$ form of the equation would have fewer solution steps than the $A = P(1 + rt)$ form would.

It will take 8 years for the future value of the investment to be at least \$8000.

I knew 7.5 years would not work because the interest is paid

b) After 8 years:
$A = P + Prt$
$A = 5000 + (5000)$
$A = 8200$

At 8 years, the future value will be \$8200.

Interest earned:
\$8200 − \$5000 = \$3200

I determined the interest earned by subtracting the principal from the future value.

$\text{Rate of return} = \frac{3200}{5000}$

Rate of return = 0.64

I compared the interest earned with the principal to determine the rate of return.

The rate of return is 64% over 8 years.

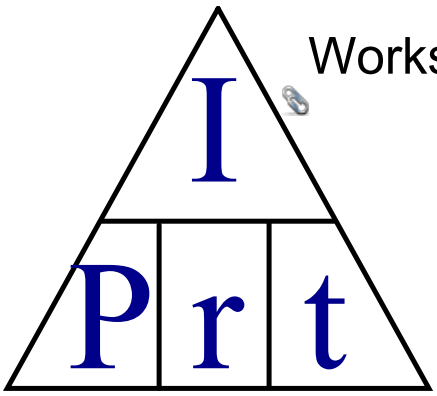
EXAMPLE 4 Determining the rate of interest on a simple interest investment p. 450

Grant invested $25 000 in a simple interest Canada Savings Bond (CSB) that paid interest annually.

a) If the future value of the CSB is $29 375 at the end of 5 years, what interest rate does the CSB earn?
b) Grant cashed in the bond after 4.5 years because a house he had been admiring came up for sale and he needed a down payment. How much money did he have for the down payment?

Check YOUR solution with the text...

PRACTICE rearranging... $\mathbf{I = Prt}$



Worksheet - Rearranging Simple Interest.pdf

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

Text p. 452: #3 & #12

Attachments

Worksheet - Rearranging Simple Interest.pdf