M9

Banking

8.6

1. Investing Money = earning interest

Interest = amount of $ earned from depositing money into a saving account or investing it in a portfolio, bonds, certified deposits, ...

Simple Interest = interest is calculated from the amount invested at the very beginning, this amount is called the principle.

$$I = Prt$$

I = interest [$]
P = principle = opening balance [$]
r = interest rate [decimal]
t = time [years]

Remember to divide the interest rate % by 100 to turn it into a decimal.

Example 1: Calculate the interest and the final balance on a saving account that gives 4.5% annual interest rate given that the opening balance on the account is $ 2000.00 and is deposited for 6 years.

$I = ?$
$P = \$2000$
$r = 4.5\% \rightarrow 0.045$
$t = 6$ years

$I = Prt$
$= (2000.00)(0.045)(6)$
$= 540.00$

Final Balance : $A = P + I$
$= 2000.00 + 540.00$
$= 2540.00$

$\therefore$ the interest earned is $ 540.00 and the Final balance is $ 2540.00

Example 2: Find the final balance on a saving account that offers 3.8% interest rate.

A) $ 5000.00 is deposited for 4 years.

$P = 5000.00$

$r = 3.8\% \rightarrow 0.038$

$t = 4$ years.

$I = Prt$

$= (5000.00)(0.038)(4)$

$= 760$

$A = P + I$

$A = 5000.00 + 760$

$A = 5760.00$

∴ the final balance is $5760.00

B) $ 12 000.00 is deposited for 6 months.

$P = \$12000.00$

$r = 0.038\ (3.8\%)$

$t = 6$ months $\rightarrow 0.5$ yrs

$I = Prt$

$= (12\,000.00)(0.038)(0.5)$

$= 228.00$

$\rightarrow$

$A = P + I$

$= 12\,000.00 + 228.00$

$= 12\,228.00$

∴ the final balance is $12 228.00

C) $ 2000.00 is deposited for 8 months.

$P = \$2000.00$

$\frac{8 \text{ months}}{1} \times \frac{1 \text{ year}}{12 \text{ months}} = \frac{8^{2}}{12_{3}}$ years

$r = 0.038$

$t = 8$ months $\rightarrow \frac{2}{3}$

$I = Prt$

$= (2000.00)(0.038)(\frac{2}{3})$ ($0.\overline{6}$)

$= 50.\overline{6}$

$= 50.67$

$A = P + I$

$= 2000.00 + 50.67$

$= 2050.67$

∴ the final balance is $2050.67

2. Borrowing Money = paying interest. Interest is the cost of borrowing.

Payday Loans = short-term loans with a very high interest rate

Example:

Amount borrowed: $500.00
Borrowing fee: $32.00 per $100.00 borrowed
Length of borrowing period: 3 weeks

A) Determine the interest charged:

Interest charged to borrow 500.00 for 3 weeks

$\frac{500.00}{100.00} = 5 \rightarrow 5(32) = \$160.00$

B) Determine the annual interest rate:

$\frac{160.00}{500.00} = 0.32 \rightarrow 32\%$

(160.00: Interest paid; 500.00: Money Borrowed)

Annual = per 1 year

52 weeks in 1 year

$\frac{32\%}{3 \text{ weeks}} \times \frac{52 \text{ weeks}}{1 \text{ years}} = \frac{(32)(52)}{3} = 554.67\% \text{ per year}$

∴ the annual interest rate is 554.67%

C) Find the total to be paid back at the end of the borrowing period:

$A = P + I$

A: Amount to be paid; P: Amount Borrowed; I: interest

$\rightarrow A = 500.00 + 160.00$

$A = \$660.00$

∴ the total to be paid $660.00

Borrowing from a bank:

Amount borrowed: $500.00
Interest rate: 8.2% (this is an annual rate) → 0.082
Length of borrowing period: 3 weeks

(1 year)
Annual Rate

A) Determine the interest charged:

$(500.00)(0.082)(3) = 41.00$ ← Annual interest

$$\frac{\$41.00}{1\ \text{year}} \times \frac{1\ \text{year}}{52\ \text{weeks}} \times \frac{3\ \text{weeks}}{1} = \frac{(41.00)(3)}{52} = \$2.37$$

∴ the interest charged is $2.37

B) Determine the annual interest rate:

The annual interest rate is 8.2% (0.082)

C) Find the total to be paid back at the end of the borrowing period:

$A = P + I$
$= 500.00 + 2.37$
$= 502.37$

∴ the total amount to be paid is $502.37