8.1: Simple and Compound Interest
Chapter 8: Financial Mathematics
MCR3U1

Simple Interest

Simple Interest (I) - interest calculated only on the original principal using the formula:
I = Prt where:
I is the interest in dollars
P is the principal in dollars
r is the annual rate of interest, as a decimal
t is the time, in years

Principal (P) - amount of money initially invested or borrowed

Amount (A) - the value of an investment or loan at the end of a time period
- can be calculated using the formula **A = P(1 + rt) or A = P + Prt**

annually / yearly

Example 1: Complete the following chart for an investment of $1000 at a rate of 5% p.a. (per annum) for 5 years.

# of years	Original Amt.	Interest Rate	Simple Interest ($)	Amount($)
1	1000	0.05	50	1050
2	1000	0.05	50	1100
3	1000	0.05	50	1150
4	1000	0.05	50	1200
5	1000	0.05	50	1250

After each year, the Amount increases by $50. Since this is a constant amount, this is an example of an arithmetic *sequence*.

Example 2: Determine the interest on $715 at an annual rate of 6.2% for 10 months.

$I = ?$
$P = 715$
$r = 6.2\%/a = 6.2 \div 100$
$t = \frac{10 \text{ months}}{12}$ (not to match)

$I = Prt$
$= 715(6.2 \div 100)\frac{10}{12}$
$= 715 \times (0.062) \times \frac{10}{12}$
$= 36.94$

∴ Interest earned in 10 months is $36.94

Example 3: How many days will $800 have to be invested at 7% annually to earn $13.50?

$I = 13.50$
$P = 800$
$r = 7\%/a = 7 \div 100 = 0.07/a$
$t = ?$

$\frac{I}{Pr} = \frac{Prt}{Pr}$
$t = \frac{I}{Pr}$
$t = \frac{13.50}{800 \times (0.07)}$

rearrange the formula

$t = \frac{13.50}{56}$
$t \div 0.24$ years
$0.24 \times 365 \div 88$

∴ It'll take about 88 days.

Pg. 481 #3, 4, 5ace, 7, 10, 11