Simple Interest

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What is Simple Interest?

Suppose you put an amount of money inn the bank. Let's call this initial amount P. We are told that after t years your month P that you deposited into the will earn intereste each year. That yearly or *annual* amount of interest that your money earns is denoted by r or r is the *interest rate*. This value is usually expressed as a decimal value or as a percentage. e.g. 0.06 or 6%. Our goal is tro try and figure out how much money you will earn after t years and what you total amount will be after those t years. Let's start by defining a few values with variables.

Variable	Name	Description
P	Principal	This is the orginal amount you deposited into the bank or put into the investment
r	anual interest rate	This is the rate at which your money will "grow" per year.
t	time in years	This is the amount of time that you have invested your money P for.
I	interest earned	This is the amount of interest you earned over the time period t.
A	total amount	This is the total amount you have, $P + I$, after the investment period t.

The relationship between these variables is,

$$I = Prt \text{ and} \tag{1}$$
$$A = P + I = P + Prt \tag{2}$$

Now we have the interest earned over that time period t,

$$I = Prt$$

and the total amount of money you have after t years is,

$$A = P + I$$

Exercises

1. Find the principal when,

    a) $I = \$550$, $r = 2.25\%/year$, $t = 7$ years.

    b) $I = \$600$, $r = 4\%/year$, $t = 3$ years.

2. Find the rate when,

    a) $P = \$4215$, $t = 12 years$, $I = \$3400$

    b) $P = \$750$, $t = 20 years$, $I = \$1750$

3. Find the time when,

    a) $P = \$10000$, $r = 8\%$, $I = \$3200$

    b) $P = \$6200$, $r = 12.75\%$, $I = \$3952.5$

4. Find the interest an total amount given,

    a) $P = \$750$, $r = 2.75\%/year$, $t = 2 years$

    b) $P = \$900$, $r = 3\%/year$, $t = 3 years$

5. Mickey lends $3000 to Donald at 10%/year and then Donald lends the same sum to Goofy at 12%/year. Find Mickey's gain over a period of 3 years.

6. What sum lent out at 6.25%/year produces the same simple interest in 2 years as $2100 lent out at 5%/year produces in 16 months?