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) $I = \$192,\ r = 6\%/year,\ t = 4$ years.
   b) $I = \$20,\ r = 2\%/year,\ t = 20$ months.
2. Find the rate when,
   a) $P = \$300,\ t = 2.5years,\ I = \$140$
   b) $P = \$9600,\ t = 3month,\ Is = \$72$
3. Find the time when,
   a) $P = \$500,\ r = 7.5\%,\ I = \$150$
   b) $P = \$700,\ r = 18\%,\ I = \$78$
4. Find the interest an total amount given,
   a) $P = \$640,\ r = 12.5\%/year,\ t = 6months$
   b) $P = \$10000,\ r = 18\%/year,\ t = 7years$
5. What sum of money will earn an interest of \$162 in 3 years at 12 % per annum?
6. At what rate per year will a sum of money double itself in 6 years?