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,

$$I = Prt \text{ and} \quad (1)$$
$$A = P + I = P + Prt \quad (2)$$

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) $I = \$210,\ r = 3.75\%/year,\ t = 40$ months.
   b) $I = \$325,\ r = 4.25\%/year,\ t = 3$ years.
2. Find the rate when,
   a) $P = \$2500,\ t = 18months,\ I = \$600$
   b) $P = \$8000,\ t = 6years,\ I = \$2000$
3. Find the time when,
   a) $P = \$925,\ r = 2.25\%,\ I = \$346.88$
   b) $P = \$750,\ r = 4.5\%,\ I = \$405$
4. Find the interest an total amount given,
   a) $P = \$2400,\ r = 9.75\%/year,\ t = 18months$
   b) $P = \$2250,\ r = 7.5\%/year,\ t = 4years$
5. Simple interest on a sum is 4/9 of the sum. Find the rate/year and time if bouth are numerically equal?
6. Sleepy and Grumpy borrowed \$3000 and \$3500, respectively, at the sa,e rate of simple interest for 3 years. If Grumpy paid \$150 more interest than Sleepy. find the rate of interest/year?

