8.1 Simple Interest

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Name:_____

8.1 – Simple Interest

Borrowing money is *not* free. Usually what you pay to the lender is a percentage of the money you borrowed. This is called interest.

If you deposit money into the bank, you are essentially lending the bank money and in exchange they pay you interest. The bank often pays you much less interest for borrowing your money than they would charge you for borrowing there is.

There are basically two ways interest is calculated:

1. Interest on the principal amount only is called simple interest and the formula to calculate this is...

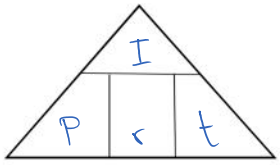
$P = \frac{I}{rt}$ $t = \frac{I}{Pr}$ $r = \frac{I}{Pt}$

Simple Interest Formula

$I = Prt$

I = Interest
P = Principal (Initial Value)
r = Interest Rate
t = time (years)

final amount → $A = P + I$



decimal ex $7\% = \frac{7}{100} = 0.07$

2. When the interest accumulated from each interest period is added to the principal and interest calculated on that amount, it is called compound interest. We will look more into compound interest later. → next section.

Note: the interest rate is expressed as a decimal and the time is expressed in years.

Think about the values of ***r*** at:

a) 3% = 0.03 b) 0.9% = 0.009 c) $\frac{1}{6}\% = 0.00\overline{16}$

Think about the values of ***t*** at:

a) 2 years

$t = 2$

b) 3 months

reduce

$t = \frac{3}{12} = \frac{1}{4}$ or 0.25

12 months in 1 year

3mo = $\frac{1}{4}$ or 0.25 years

c) 10 days

reduce

$t = \frac{10}{365} = \frac{2}{73}$ or 0.027...

exact approx.

365 days in 1 year

Example 1: If Sam were to invest $350.00 at 7% per year for 16 months. Calculate:

a) the simple interest

$P = 350$, $r = 0.07$, $t = \frac{16}{12} = \frac{4}{3}$

$I = Prt$

$= (350)(.07)(\frac{4}{3})$

$= \$32.\overline{6}$

$I = \$32.67$

keep two decimals with $.

b) the amount of the investment at the end of 16 months

$A = P + I$

$= 350 + 32.67$

$A = \$382.67$

Example 2: If Aya acquired a $2000.00 loan for 8 months and was required to pay $64 in interest. What was the annual rate of interest?

$P = \$2000$

$t = \frac{8}{12} = \frac{2}{3}$

$I = \$64$

$r = \frac{I}{Pt}$

$= \frac{(64)}{(2000)(\frac{2}{3})}$

$= 0.048 \cdot 100$

$r = 4.8\%$

convert into a percent by multiplying by 100.

Example 3: If Don made a 3 year investment at 4.5% interest and earned $675. How much was the original investment?

$t = 3$

$r = 0.045$

$I = \$675$

$P = ?$

$P = \frac{I}{rt}$

$= \frac{675}{(.045)(3)}$

$P = \$5000$

Example 4: What principal must be invested now at 1.25% annual simple interest to have an amount of $174 in 2 years?

$r = 0.0125$

$A = \$174$

$t = 2$

$A = P + I$

$A = P + Prt$

$A = P(1 + rt)$

$\frac{A}{1+rt} = \frac{P(1+rt)}{1+rt}$

$\frac{A}{1+rt} = P$

$P = \frac{174}{1 + (.0125)(2)}$

$= \frac{174}{1.025}$

$P = \$169.76$

HW: 8.1 WS