

M9

Simple Interest

8.7

$$I = prt$$

$I =$ Interest earned OR charged in \$

$p =$ Principle = initial amount invested OR borrowed in \$

$r =$ annual interest rate expressed as a decimal

$t =$ time in years

Final Amount = Interest + Principle

$$A = P + I$$

$$A = I + P$$

Example: Determine the amount of simple interest charged and the total amount to be paid at the end of the loan period.

- Amount borrowed: \$ 3000.00 = P
- Annual interest rate: 9.5% $\rightarrow 0.095 = r$
- Length of borrowing period: 3.5 years = t

$$\begin{aligned} I &= prt \\ &= (3000.00)(0.095)(3.5) \\ &= 997.50 \end{aligned}$$

$$\begin{aligned} A &= P + I \\ A &= 3000.00 + 997.50 \\ &= 3997.50 \end{aligned}$$

\therefore the interest charge is \$997.50 and the final amount is \$3997.50

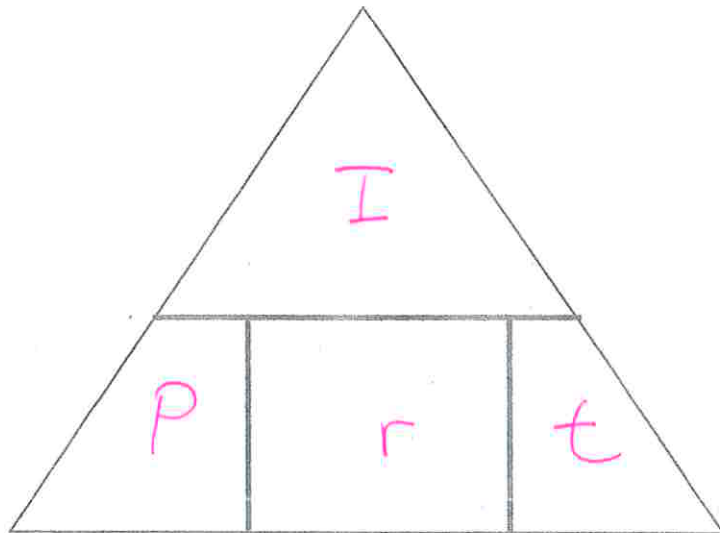
Solving for different quantities using the simple interest formula:

$$I = Prt$$

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

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

$$t = \frac{I}{(Pr)}$$



Examples:

- A) Kate deposited \$1200.00 into her bank account. After 3 years, her bank account balance was \$1362.00. What interest did she earn? What is the annual interest rate on her account?

$$P = 1200.00$$

$$A = 1362.00$$

$$t = 3 \text{ years}$$

$$A = P + I$$

$$I = A - P \quad (\text{Final amount less the initial amount gives the interest earned for char.})$$

$$I = 1362.00 - 1200.00$$

$$I = 162.00$$

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

$$r = \frac{162.00}{(1200.00)(3)}$$

$$r = 0.045 \rightarrow (0.045)(100) = 4.5\%$$

\therefore The interest earned was $\$162.00$ and the annual was 4.5% .



B) How long does it take to triple the investment of \$2800.00 deposited in an account earning an interest rate of 6.8% ?

C) 18 months after Bob borrowed \$5000.00 from a bank, he wanted to pay off his loan. How much does he owe if he was charged an annual interest rate of 5.8%?



