

What's Going On?

Checking In

Minds on

Save Your Money

Action!

Formulating Simple Interest

Consolidation

Simple Interest Problems

Learning Goal - I will be able to solve problems involving investments earning simple interest.

Minds on

Save Your Money

You have \$2,500 to invest.

You speak to your bank and they offer to pay you 5% of your original investment at the end of each year.

How much interest will you earn at the end of the first year?

What will your total investment be worth at the end of the first year.

Don't write this down!

Action!

Formulating Simple Interest

A Simple Interest investment only earns interest on the initial investment (Principal).

In Simple Interest problems, we have five different variables to consider:

P is the principal / initial investment

r is the interest rate as a percent

t is the time of the investment in years

I is the total interest earned

A is the total value of the investment

Action!

Formulating Simple Interest

Let's use the variables to create a formula for Simple Interest.

You have $\$2,500$ to invest.

You speak to your bank and they offer to pay you 5% of your original investment at the end of each year.

How much interest will you earn at the end of the first year?

$$P = 2500$$

$$r = 0.05$$

$$t = 1$$

$$I = 2500 \times 0.05 \\ = 125$$

Action!

Formulating Simple Interest

You have \$2,500 to invest.

You speak to your bank and they offer to pay you 5% of your original investment at the end of each year.

How much interest will you have earned, in total, at the end of the second year?

$$\begin{array}{l} P = 2500 \\ r = 0.05 \\ t = 2 \end{array} \quad \begin{array}{l} \text{interest after 1 year} \\ 2500 \times 0.05 \\ \text{interest after second year} \\ 2500 \times 0.05 \end{array}$$

$$\begin{aligned} I &= \underline{2500 \times 0.05 + 2500 \times 0.05} \\ &= 2 \times (2500 \times 0.05) \\ &= 250 \end{aligned}$$

Action!

Formulating Simple Interest

You have \$2,500 to invest.

You speak to your bank and they offer to pay you 5% of your original investment at the end of each year.

How much interest will you have earned, in total, at the end of the third year?

$$\begin{aligned}P &= 2500 \\r &= 0.05 \\t &= 3\end{aligned}$$

$$\begin{aligned}I &= 3 \times (2500 \times 0.05) \\&= 375\end{aligned}$$

Action!

Formulating Simple Interest

You have \$2,500 to invest.

You speak to your bank and they offer to pay you 5% of your original investment at the end of each year.

How much interest will you have earned, in total, at the end of year t ?

$$I = t \times P \times r$$
$$I = Prt$$

Action!

Formulating Simple Interest

$$I = Prt$$

Action!

Formulating Simple Interest

You have \$2,500 to invest.

You speak to your bank and they offer to pay you 5% of your original investment at the end of each year.

What will be the total value, A , of your investment at the end of t years?

$$A = P + I$$
$$A = \underbrace{P} + \underbrace{Prt}$$
$$A = P(1 + rt)$$

Action!

Formulating Simple Interest

$$A = P(1 + rt)$$

Consolidation

Simple Interest Problems

How much ^I interest would be earned on a principal of ^P \$5000 invested at ^r 4.5% simple interest over a period of ^t 15 years?

$$I = ?$$

$$P = 5000$$

$$r = 0.045$$

$$t = 15$$

$$I = Prt$$

$$I = 5000 \times 0.045 \times 15$$

$$I = 3,375$$

Consolidation

Simple Interest Problems

What would be the total value of a \$10,000 initial investment that earned 3.25% **simple** interest for 5 years? *find I first*

$$A = P + I$$

$$A = P + Prt$$

$$A = P(1 + rt)$$

$$P = 10,000$$

$$r = 0.0325$$

$$t = 5$$

$$A = 10000(1 + 0.0325(5))$$

$$A = 10000(1 + 0.1625)$$

$$A = 10000(1.1625)$$

$$A = 11,625$$

Consolidation

Simple Interest Problems

You borrow $\$540$ for 85 days by taking a cash advance on your credit card. The interest rate is 26% simple interest.

- a. How much will you need to pay back at the end of the loan period?
- b. How much interest will you have paid?

a. Solving for A (final amount)

$$A = P(1 + rt)$$

$$A = 540 \left(1 + 0.26 \times \frac{85}{365} \right)$$

$$A = 572.70$$

b) total interest
32.70

Consolidation

Simple Interest Problems

P
 You invest \$4850 at 7.6% simple interest. If you want the money to increase to \$8000, how long will you need to leave the money invested?

$$A = P(1 + rt)$$

$$A = P + Prt$$

use

$$8000 = 4850 + (4850)(0.076)t$$

$$\frac{3150}{366.60} = \frac{366.60}{366.60} t$$

$$t = 8.55$$

$$0.55 \times 365 = 201$$

or *about* 8 years and 201 days

Consolidation

Homework

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