

SIMPLE ONE-TIME INTEREST

$$I = P_0 r$$

$$A = P_0 + I = P_0 + P_0 r = P_0(1 + r)$$

I is the _____

A is the _____: principal plus interest

P_0 is the _____ (starting amount)

r is the _____ (in _____ form.

Example: 5% = 0.05)

Example

A local business asks for a \$750 loan to cover some expenses and agrees to repay it in 60 days with 5% interest. How much interest will you earn?

$P_0 = \$$ _____ (the principal)

$r =$ _____ (% rate)

$I = \$$ _____ \times _____ = \$_____.

You will earn \$_____ in interest.

Question

An organization requests a \$1,200 loan for a short-term project and agrees to repay it in 90 days with 6% interest. How much interest will you earn?

Simple Interest over Time

$$I = P_0 r t$$

$$A = P_0 + I = P_0 + P_0 r t = P_0(1 + r t)$$

I is the _____

A is the end amount: principal plus interest

_____ is the principal (starting amount)

r is the interest rate in decimal form

t is _____

The units of measurement (years, months, etc.) for the time should match the time period for the interest rate.

Example

Imagine your state is funding a new wildlife reserve and issues bonds to raise money for the project. You purchase a \$2,000 bond that pays 4% interest annually and matures in 10 years. How much interest will you earn?

Each year, you would earn _____% interest:

_____ × _____ = \$80 in interest. So over the course of ten years, you would earn a total of _____ × _____ = \$800 in interest. When the bond matures, you would receive back the \$2,000 you originally paid, leaving you with a total of \$2,800.

APR – Annual Percentage Rate

Interest rates are usually given as an _____ – the total interest that will be paid in the year. If the interest is paid in smaller time increments, the APR will be divided up.

For example, a 6% APR paid monthly would be divided into twelve 0.5% payments. $6 \div 12 = 0.5$
A 4% annual rate paid quarterly would be divided into four 1% payments. $4 \div 4 = 1$

Question

A nearby county is raising funds to build a new library and issues bonds to support the project. You decide to purchase a \$1,500 bond that pays 3.5% interest annually and matures in 8 years. How much interest will you earn?

Example

Corporate bonds are issued by companies to raise funds for their projects. Suppose you purchase a \$2,000 corporate bond with a 6% annual rate, paid semi-annually, with a maturity in 3 years. How much interest will you earn?

Since interest is paid semi-annually (twice a year), the _____% interest is divided into two 3% payments. _____ = \$2000

(the principal)

$r = \underline{\hspace{2cm}}$ (3% rate per half-year)

$t = \underline{\hspace{2cm}}$ (3 years = 6 half-years)

$I = 2000 \times \underline{\hspace{2cm}} \times 6 = \$360.$

You will earn \$360 interest in total over the three years.

Question

Municipal bonds are issued by local governments to fund public projects. Suppose you buy a \$1,500 municipal bond with a 5% annual interest rate, paid semi-annually, with a maturity in 2 years. How much interest will you earn?

Question

Samira invests \$5,000 into an account at an annual rate of 1.2% simple interest for 18 months.

What is the Principal in this scenario?

- A 1.2%
- B 0.012
- C \$5,000
- D 1.5

What is the interest rate for this account?

- A \$5,000
- B 1.5
- C 1.2%
- D 0.012

Question

Samira invests \$5,000 into an account at an annual rate of 1.2% simple interest for 18 months.

What number do you use to represent the interest rate in the simple interest formula?

- A \$5,000
- B 0.012
- C 1.2%
- D 1.5

What is the length of time of this investment, in years?

- A 0.012
- B 1.2%
- C 1.5
- D \$5,000

Calculate the simple interest earned on this account

Example

A payday lender charges \$45 in interest for a two-month loan of \$600. Find the annual interest rate they are charging.

$I = \$45$ (interest)

$P_0 = \$600$

$t = 2$ months

Using $I = P_0 \times r \times t$, we get $___ = ___ \times ___ \times ___$. Solving for r , we find $r = 0.0375$, or 3.75%. Since the time was in months, this is the monthly interest rate. The annual rate would be 6 times this: 45% interest.

Question

A credit union charges \$20 interest for a three-month loan of \$400. Find the annual interest rate they are charging.