SIMPLE ONE-TIME INTEREST

$$I = P_0 r$$

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

I is the interest
A is the end amount: principal plus interest
P_0 is the principal (starting amount)
r is the interest rate (in decimal 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?

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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 = $750 (the principal)
r=0.05 (5% rate)
I=$750×0.05=$37.50.

You will earn $37.50 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

I is the interest

A is the end amount: principal plus interest

P_0 is the principal (starting amount)

r is the interest rate in decimal form

t is time

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?

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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 4% interest: $2000 \times 0.04 = \$80$ in interest. So over the course of ten years, you would earn a total of $80 \times 10 = \$800$ in interest. When the bond matures, you would receive back the $2,000 you originally paid, leaving you with a total of $2,800.

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?

APR – Annual Percentage Rate

Interest rates are usually given as an annual percentage rate (APR) – 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. $4 \div 4 = 1$

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?

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Since interest is paid semi-annually (twice a year), the 6% interest is divided into two 3% payments. P_0 = $2000 (the principal)
r=0.03 (3% rate per half-year)
t=6 (3 years = 6 half-years)
I=2000×0.03×6=$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

Question

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

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

Question

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

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

A 0.012

B 1.2%

C 1.5

D $5,000

Question

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

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.

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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 $45=600 \times r \times 2$. 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.