U8D1 MCR3UI

Simple and Compound Interest

Definitions: **Interest**: a fee charged for the use of money

Principal (P):

Interest Rate (r):

Time (t):

Amount (A):

Interest (I):

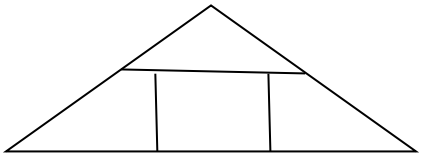
/a or per annum:

Simple Interest Formula

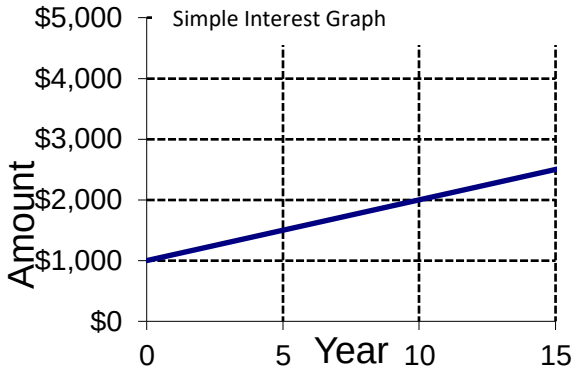
Interest that is calculated only on the original principal.

I=Prt

A=P+I



Linear Graph



Examples:

3. Calculate how much interest is earned if $2000 is invested at 4% simple interest for 26 weeks.

4. What principal is needed to have $500 in interest, in 18 months, invested at 2.5%/a simple interest?

5. What rate of simple interest is needed to get $7000 to grow to $10000 in 5 years?

More Definitions for Compound Interest

i = interest rate per compounding period

(interest rate ÷ 100 ÷ number of times per year interest is calculated)

n = number of periods

(number of years x number of times per year interest is calculated)

P = Principal (Original amount invested or borrowed) This is sometimes referred to as Present Value or PV

A= Final Amount (includes interest and principal)

Typical Compounding periods

Compounding Period	Number of Times per year interest is compounded
Annually	
Semi-annually	
Quarterly	

Bi-monthly	
Monthly	
Bi-weekly	
Weekly	
Daily	

Example 1: If the interest rate is 12%/a compounded monthly for 2 years, how many compounding periods are there and what is the interest rate per period.

Compound Interest Formula

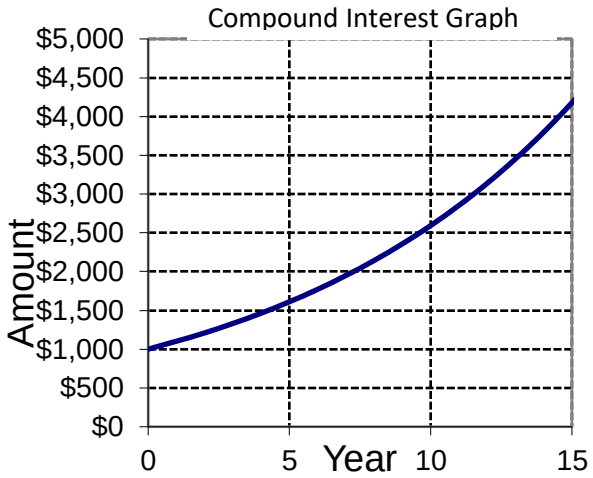
Interest earned on interest as well as the principal

future value $A = P(1+i)^n$

or

present value $P =$

Exponential Growth Graph



Examples

1. *a) Find the future amount of an investment of $2200 for 5 years at 3.4% per annum compounded monthly.*

   i= *n=* *A =*

   $A = P(1+i)^n$

   Therefore, the investment will be worth $_____after 5 years.

   b) How much interest was earned?

2. *Sue wants to invest in her niece's education. How much should she invest on the day her niece was born to have $22 000 on her 18th birthday, if the money earns 7%/a compounded quarterly?*

   i= *n=* *A =*

   $PV = A(1+i)^{-n}$

   Therefore, she should invest $_____when her niece is born.

3. What rate of interest, compounded semi-annually, will grow $26 000 to $40 000 in 5 years?