**Simple Interest (SI) :**

If the interest on a sum borrowed for certain period is reckoned uniformly, then it is called simple interest.

**Principal:** The money borrowed or lent out for certain period is called the principal or the Sum.  
**Interest:** Extra money paid for using other money is called interest.  
  
Let Principal = P, Rate = r % per annum (p.a.), and Time = t years then

**Simple Interest(SI)= ((P×r×t))/100**

Using this formula we can also find out   
P=(100×SI)/(r×t);  
r=(100×SI)/(P×t);  
t=(100×SI)/(P×r).  
  
**Compound Interest (CI):**  
When compound interest is applied, interest is paid on both the original principal and on earned interest.  
***So for one year Simple interest and Compound interest both are equal.***

Suppose if you make a deposit into a bank account that pays compounded interest, you will receive interest payments on the original amount   
that you deposited, as well as additional interest payments.  
  
This allows your investment to grow even more than if you were paid only simple interest.

So Amount at the end of 1st year (or Period) will become the principal for the 2nd year (or Period) and  
Amount at the end of 2nd year (or Period) becomes the Principal of 3rd year.  
  
Amount = Principal + Interest

**A= P (1+r/100) ^n**

A= Amount,   
P= Principal,   
r= Rate %,   
n= no. of years.

So, Compound Interest = [P (1+r/100) ^ n - P]

**CI= P [(1+r/100) ^ n – 1]**

**Condition:-**  
**1.**When  interest is compounded annually,   
Amount = P(1+r/100)^n  
**2.**When interest  is compounded half yearly,  
Amount = P(1+(r/2)/100)^2n  
**3.**When interest is compounded Quarterly,  
Amount =P(1+(r/4)/100)^4n  
**4.**When interest is compounded annually but time is in fraction, say 3 whole 2/5 year   
Amount = P(1+r/100)^3×(1+(2r/5)/100)  
**5.**When Rates are different for different years, say r1%, r2%, and r3% for 1st, 2nd and 3rd year respectively.Then,      
Amount = P(1+r1/100)×(1+r2/100)×(1+r3/100).  
  
  
Present worth of Rs. x due n years hence is given by:

**Present Worth = x/(1+r/100)**

**Difference between Compound Interest & Simple interest Concept**

**For Two years:**

CI – SI =P(r/100)^2

**For Three Year:**

CI – SI =P(r^2/(100^2 ))×(300+r)/100)

**For  Two year:**

CI/SI=(200+r)/200

**SOLVED EXAMPLES**

**1.Wanda borrowed $3,000 from a bank at an interest rate of 12% per year for a 2-year period. How much interest does she have to pay the bank at the end of 2 years?**  
**Solution :**  
Simple Interest = 3,000 × 12% × 2 = 720  
She has to pay the bank $720 at the end of 2 years.  
  
**2.Raymond bought a car for $40, 000. He took a $20,000 loan from a bank at an interest rate of 15% per year for a 3-year period. What is the total amount (interest and loan) that he would have to pay the bank at the end of 3 years?**  
**Solution :**  
Simple Interest = 20,000 × 13% × 3 = 7,800  
At the end of 3 years, he would have to pay  
$20,000 + $7,800 = $27,800

**3.Find the compound amount and compound interest on the principal 20,000 borrowed at 6% compounded annually for 3 years.**  
**Solution:**  
Let P = 20000, r = 6%, n = 3  
using formula   
A=P(1+r)^n=20000(1+.06)^3=23820.32   
Compound interest =23820.32−20000=3820.32

**4. A certain sum amounts to $ 72900 in 2 years at 8% per annum compound interest, compounded annually. Find the sum.  
Solution:**   
Let the sum be $ 100. Then,   
amount = $ {100 × (1 + 8/100)²}  
= $ (100 × 27/25 × 27/25) = $ (2916/25)   
If the amount is $ 2916/25 then the sum = $ 100.   
If the amount is $ 72900 then the sum = $ (100 × 25/2916 × 72900) = $ 62500.