Comparing Quantities

Percent

The word percent means ‘per hundred’ or ‘hundredths’. We denote it by the symbol %.
A fraction with denominator 100 is called a ‘percent’.

Percent as a fraction

To express a percent in the form of a fraction

1. we simply drop the percent sign and
2. multiply the given number by $\frac{1}{100}$.

Percent as a decimal

1. We divide the given number by hundred after dropping the percent sign.

Percent as a ratio

1. Express it as a fraction.
2. Reduce it to its simplest form.

Profit and Loss

Cost Price : The price paid to buy an article.

Selling Price : The amount at which an article is sold.
Profit or gain : If S.P. is greater than C.P.
Loss : If C.P. is greater than S.P.

Profit = S.P. - C.P.
Loss = C.P. - S.P.

For Profit	For Loss
$Profit\,\% = \frac{Profit}{C.P.} \times 100$	$Loss\,\% = \frac{Loss}{C.P.} \times 100$
$S.P. = C.P.\left(\frac{100 + Profit}{100}\right)$	$S.P. = C.P.\left(\frac{100 - Loss}{100}\right)$
$C.P. = \frac{100 \times S.P.}{100 + Profit\,\%}$	$C.P. = \frac{100 \times S.P.}{100 - Loss\,\%}$

Discount

The deduction on the marked price is known as discount.

Marked Price

The printed price on the tag of an article is called Marked Price. It is also called List price or usual price.

Net Price

The net price is the difference between the marked price after discount.

Net Price = Marked price - Discount

Formulae

1. Net Price = 100 - Discount % x Marked price
2. $Discount = \frac{Discount\ \% \times Marked\ Price}{100}$
3. $Discount = \frac{Actual\ Discount}{Marked\ Price} \times 100$

Simple Interest

$S.I. = \frac{P \times R \times T}{100}$

A = S.I. + P

Where, A = Amount, P = Principal, R = Rate , T = time in Years, days

Compound Interest

The difference between the amount and the money borrowed is called the compound Interest for that period.

So, compound interest is
C.I. = A - P
A is amount
P is principal

Calculation of compound interest by Unitary Method

Case I : When interest is compounded annually.

In this case , when the interest is compounded annually, the interest charged during the first year is added to the principal and the amount thus obtained becomes the principal for the second year.

Case II : When interest is compounded half yearly

The rate becomes half or (R/2)%. The amount that is calculated will be the principal for the next half year.

Case III : When interest is compounded quarterly

The rate becomes half or (R/4)%. The amount that is calculated will be the principal for the next quarter.

Compound interest using Formulae

I. Interest compounded annually

$$A = p\left(1 + \frac{r}{100}\right)^{n}$$

Where ‘P’ is the principal, ‘r’ is the rate of interest per annum, ‘n’ is the number of years and ‘A’ is the amount after ‘n’ years.

Also compound interest = (A-P)

II. Interest is compounded annually but the rates are different for different years.

Suppose the principal is P, time is 2 years and the rate of interest m% and n% for the first year and the second year respectively.

Then,

$A = p\left(1 + \frac{m}{100}\right)\left(1 + \frac{n}{100}\right)$

And $C.I. = A - P$

III. When interest is compounded annually but time is in fractions, say q$\frac{m}{n}$ years:

$A = p\left(1 + \frac{R}{100}\right)^{q}\left(1 + \frac{\frac{m}{n}R}{100}\right)$

IV. When the interest is compounded half yearly :

P = Principal, r is rate of interest per annum and time be 'n' years for interest be compounded half yearly,

Rate = (R/2)% per half year

Time = 2n half years

Amount = $A = p\left(1 + \frac{R}{2\times100}\right)^{2n}$

C.I. = A -P

V. When the interest is compounded quarterly

Let principal be P, Rate = r% p.a. And time = n years,

For the interest be calculated quarterly,

Rate = (R/4) % per quarter

Time = (4xn) quarter

$$A = p\left(1 + \frac{R}{4\times100}\right)^{4n}$$

And C.I. = A - P