-greatest number that divide all three number x,y,z y-x, z-y, z-x

- which is lowest fraction….a/b a-b should smallest

-LCM L.C.M. of 21, 36, 66 = 2772.

Now, 2772 = 2 x 2 x 3 x 3 x 7 x 11

To make it a perfect square, it must be multiplied by 7 x 11.

So, required number = 22 x 32 x 72 x 112 = 213444

**Trains :**

* Km to meter a\*(5/18)//a\*0.27778
* Meter to km a\*(18/5) //a\* 3.6
* If two trains (or bodies) start at the same time from points A and B towards each other and after crossing they take *a* and *b* sec in reaching B and A respectively, then:(A's speed) : (B's speed) = (b : a)
* **Time =distance/speed**
* In same direction add the **speed** and **length** and opposite subtract **speed** and **length**

**Gain or Loss :**

**IMPORTANT FACTS**

**Cost Price:**

The price, at which an article is purchased, is called its **cost price**, abbreviated as **C.P.**

**Selling Price:**

The price, at which an article is sold, is called its **selling prices**, abbreviated as **S.P.**

**Profit or Gain:**

If S.P. is greater than C.P., the seller is said to have a **profit** or **gain**.

**Loss:**

If S.P. is less than C.P., the seller is said to have incurred a **loss**.

**IMPORTANT FORMULAE**

1. Gain = (S.P.) - (C.P.)
2. Loss = (C.P.) - (S.P.)
3. Loss or gain is always reckoned on C.P.
4. Gain Percentage: (Gain %)

|  |  |  |  |
| --- | --- | --- | --- |
| Gain % = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | Gain x 100 | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif |
| C.P. |

1. Loss Percentage: (Loss %)

|  |  |  |  |
| --- | --- | --- | --- |
| Loss % = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | Loss x 100 | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif |
| C.P. |

1. Selling Price: (S.P.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SP = | http://www.indiabix.com/_files/images/aptitude/1-sym-obracket-h1.gif | (100 + Gain %) | x C.P | http://www.indiabix.com/_files/images/aptitude/1-sym-cbracket-h1.gif |
| 100 |

1. Selling Price: (S.P.)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SP = |  | (100 - Loss %) | x C.P. |  |

**Time and work :**

1. **Work from Days:**

|  |  |  |
| --- | --- | --- |
| If A can do a piece of work in *n* days, then A's 1 day's work = | 1 | . |
| *n* |

1. **Days from Work:**

|  |  |  |  |
| --- | --- | --- | --- |
| If A's 1 day's work = | 1 | , | then A can finish the work in *n* days. |
| *n* |

1. **Ratio:**

If A is thrice as good a workman as B, then:

Ratio of work done by A and B = 3 : 1.

Ratio of times taken by A and B to finish a work = 1 : 3.

**Problem on ages :**

**Important Formulas on "Problems on Ages" :**

1. If the current age is *x*, then *n* times the age is *nx*.

2. If the current age is *x*, then age *n* years later/hence = *x* + *n*.

3. If the current age is *x*, then age *n* years ago = *x* - *n*.

4. The ages in a ratio *a* : *b* will be *ax* and *bx*.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 5. If the current age is *x*, then | 1 | of the age is | *x* | . |
| *n* | *n* |

**Average :**

1. **Average:**

|  |  |  |  |
| --- | --- | --- | --- |
| Average = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | Sum of observations | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif |
| Number of observations |

1. **Average Speed:**

Suppose a man covers a certain distance at *x* kmph and an equal distance at *y* kmph.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Then, the average speed druing the whole journey is | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | 2*xy* | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | kmph. |
| *x* + *y* |

**Permutation and combination**

1. **Factorial Notation:**

Let *n* be a positive integer. Then, factorial *n*, denoted *n*! is defined as:

**n! = n(n - 1)(n - 2) ... 3.2.1.**

**Examples:**

* 1. We define **0! = 1**.
  2. 4! = (4 x 3 x 2 x 1) = 24.
  3. 5! = (5 x 4 x 3 x 2 x 1) = 120.

1. **Permutations:**

The different arrangements of a given number of things by taking some or all at a time, are called permutations.

**Examples:**

* 1. All permutations (or arrangements) made with the letters *a*, *b*, *c* by taking two at a time are (***ab*, *ba*, *ac*, *ca*, *bc*, *cb***).
  2. All permutations made with the letters *a*, *b*, *c* taking all at a time are:  
     (***abc*, *acb*, *bac*, *bca*, *cab*, *cba***)

1. **Number of Permutations:**

Number of all permutations of *n* things, taken *r* at a time, is given by:

|  |  |
| --- | --- |
| nPr = *n*(*n* - 1)(*n* - 2) ... (*n* - *r* + 1) = | *n*! |
| (*n* - *r*)! |

**Examples:**

* 1. 6P2 = (6 x 5) = 30.
  2. 7P3 = (7 x 6 x 5) = 210.
  3. **Cor. number of all permutations of *n* things, taken all at a time = *n*!.**

1. **An Important Result:**

If there are *n* subjects of which *p*1 are alike of one kind; *p*2 are alike of another kind;*p*3 are alike of third kind and so on and *p*r are alike of *r*th kind,   
such that (*p*1 + *p*2 + ... *p*r) = *n*.

|  |  |
| --- | --- |
| Then, number of permutations of these *n* objects is = | *n*! |
| (*p*1!).(*p*2)!.....(*p*r!) |

1. **Combinations:**

Each of the different groups or selections which can be formed by taking some or all of a number of objects is called a **combination**.

**Examples:**

* 1. Suppose we want to select two out of three boys A, B, C. Then, possible selections are AB, BC and CA.

Note: AB and BA represent the same selection.

* 1. All the combinations formed by *a*, *b*, *c* taking ***ab*, *bc*, *ca***.
  2. The only combination that can be formed of three letters *a*, *b*, *c* taken all at a time is ***abc***.
  3. Various groups of 2 out of four persons A, B, C, D are:

**AB, AC, AD, BC, BD, CD**.

* 1. Note that *ab* *ba* are two different permutations but they represent the same combination.

1. **Number of Combinations:**

The number of all combinations of *n* things, taken *r* at a time is:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| nCr = | *n*! | = | *n*(*n* - 1)(*n* - 2) ... to *r* factors | . |
| (*r*!)(*n* - *r*)! | *r*! |

**Note:**

* 1. nCn = 1 and nC0 = 1.
  2. nCr = nC(n - r)

**Examples:**

|  |  |  |
| --- | --- | --- |
| i.   11C4 = | (11 x 10 x 9 x 8) | = 330. |
| (4 x 3 x 2 x 1) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ii.   16C13 = 16C(16 - 13) = 16C3 = | 16 x 15 x 14 | = | 16 x 15 x 14 | = 560. |
| 3! | 3 x 2 x 1 |

**HCF& LCM :**

1. **Factors and Multiples:**

If number *a* divided another number *b* exactly, we say that *a* is a **factor** of *b*.

In this case, *b* is called a **multiple** of *a*.

1. **Highest Common Factor (H.C.F.) or Greatest Common Measure (G.C.M.) or Greatest Common Divisor (G.C.D.):**

The H.C.F. of two or more than two numbers is the greatest number that divides each of them exactly.

There are two methods of finding the H.C.F. of a given set of numbers:

* 1. **Factorization Method:** Express the each one of the given numbers as the product of prime factors. The product of least powers of common prime factors gives H.C.F.
  2. **Division Method:** Suppose we have to find the H.C.F. of two given numbers, divide the larger by the smaller one. Now, divide the divisor by the remainder. Repeat the process of dividing the preceding number by the remainder last obtained till zero is obtained as remainder. The last divisor is required H.C.F.

**Finding the H.C.F. of more than two numbers:** Suppose we have to find the H.C.F. of three numbers, then, H.C.F. of [(H.C.F. of any two) and (the third number)] gives the H.C.F. of three given number.

Similarly, the H.C.F. of more than three numbers may be obtained.

1. **Least Common Multiple (L.C.M.):**

The least number which is exactly divisible by each one of the given numbers is called their L.C.M.

There are two methods of finding the L.C.M. of a given set of numbers:

* 1. **Factorization Method:** Resolve each one of the given numbers into a product of prime factors. Then, L.C.M. is the product of highest powers of all the factors.
  2. **Division Method (short-cut):** Arrange the given numbers in a rwo in any order. Divide by a number which divided exactly at least two of the given numbers and carry forward the numbers which are not divisible. Repeat the above process till no two of the numbers are divisible by the same number except 1. The product of the divisors and the undivided numbers is the required L.C.M. of the given numbers.

1. **Product of two numbers = Product of their H.C.F. and L.C.M.**
2. **Co-primes:** Two numbers are said to be co-primes if their H.C.F. is 1.
3. **H.C.F. and L.C.M. of Fractions:**

|  |  |
| --- | --- |
| 1. H.C.F. = | H.C.F. of Numerators |
| L.C.M. of Denominators |

|  |  |
| --- | --- |
| 2. L.C.M. = | L.C.M. of Numerators |
| H.C.F. of Denominators |

1. **H.C.F. and L.C.M. of Decimal Fractions:**

In a given numbers, make the same number of decimal places by annexing zeros in some numbers, if necessary. Considering these numbers without decimal point, find H.C.F. or L.C.M. as the case may be. Now, in the result, mark off as many decimal places as are there in each of the given numbers.

1. **Comparison of Fractions:**

Find the L.C.M. of the denominators of the given fractions. Convert each of the fractions into an equivalent fraction with L.C.M as the denominator, by multiplying both the numerator and denominator by the same number. The resultant fraction with the greatest numerator is the greatest.

**Alligation and mixture**

1. **Alligation:**

It is the rule that enables us to find the ratio in which two or more ingredients at the given price must be mixed to produce a mixture of desired price.

1. **Mean Price:**

The cost of a unit quantity of the mixture is called the mean price.

1. **Rule of Alligation:**

If two ingredients are mixed, then

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | Quantity of cheaper | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | C.P. of dearer - Mean Price | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif |
| Quantity of dearer | Mean price - C.P. of cheaper |

We present as under:

|  |  |  |
| --- | --- | --- |
| C.P. of a unit quantity of cheaperC.P. of a unit quantity of dearer | | |
| (*c*) | Mean Price (*m*) | (*d*) |
| (*d* - *m*) | (*m* - *c*) |

http://www.indiabix.com/_files/images/aptitude/1-sym-tfr.gif (Cheaper quantity) : (Dearer quantity) = (*d* - *m*) : (*m* - *c*).

1. Suppose a container contains *x* of liquid from which *y* units are taken out and replaced by water.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| After *n* operations, the quantity of pure liquid = | http://www.indiabix.com/_files/images/aptitude/1-sym-obracket-h2.gif | *x* | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | 1 - | *y* | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | *n* | http://www.indiabix.com/_files/images/aptitude/1-sym-cbracket-h2.gif | units. |
| *x* |

**Time and Distance**

1. **Speed, Time and Distance:**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Speed = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | Distance | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | , | Time = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | Distance | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | , | Distance = (Speed x Time). |
| Time | Speed |

1. **km/hr to m/sec conversion:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *x* km/hr = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | *x* x | 5 | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | m/sec. |
| 18 |

1. **m/sec to km/hr conversion:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *x* m/sec = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | *x* x | 18 | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | km/hr. |
| 5 |

1. If the ratio of the speeds of A and B is *a* : *b*, then the ratio of the

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| the times taken by then to cover the same distance is | 1 | : | 1 | or *b* : *a*. |
| *a* | *b* |

1. Suppose a man covers a certain distance at *x* km/hr and an equal distance at *y* km/hr. Then,

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| the average speed during the whole journey is | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | 2*xy* | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | km/hr. |
| *x* + *y* |

**Area :**

1. **Results on Triangles:**
   1. Sum of the angles of a triangle is 180°.
   2. The sum of any two sides of a triangle is greater than the third side.
   3. **Pythagoras Theorem:**

In a right-angled triangle, (Hypotenuse)2 = (Base)2 + (Height)2.

* 1. The line joining the mid-point of a side of a triangle to the positive vertex is called the **median**.
  2. The point where the three medians of a triangle meet, is called **centroid.** The centroid divided each of the medians in the ratio 2 : 1.
  3. In an isosceles triangle, the altitude from the vertex bisects the base.
  4. The median of a triangle divides it into two triangles of the same area.
  5. The area of the triangle formed by joining the mid-points of the sides of a given triangle is one-fourth of the area of the given triangle.

1. **Results on Quadrilaterals:**
   1. The diagonals of a parallelogram bisect each other.
   2. Each diagonal of a parallelogram divides it into triangles of the same area.
   3. The diagonals of a rectangle are equal and bisect each other.
   4. The diagonals of a square are equal and bisect each other at right angles.
   5. The diagonals of a rhombus are unequal and bisect each other at right angles.
   6. A parallelogram and a rectangle on the same base and between the same parallels are equal in area.
   7. Of all the parallelogram of given sides, the parallelogram which is a rectangle has the greatest area.

**IMPORTANT FORMULAE**

1. 1.   Area of a rectangle = (Length x Breadth).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| http://www.indiabix.com/_files/images/aptitude/1-sym-tfr.gif Length = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | Area | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | and Breadth = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | Area | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | . |
| Breadth | Length |

1. 2.   Perimeter of a rectangle = 2(Length + Breadth).
2. Area of a square = (side)2 = http://www.indiabix.com/_files/images/aptitude/1-div-1by2.gif(diagonal)2.
3. Area of 4 walls of a room = 2 (Length + Breadth) x Height.
4. 1.   Area of a triangle = http://www.indiabix.com/_files/images/aptitude/1-div-1by2.gif x Base x Height.

2.   Area of a triangle = *s*(*s*-*a*)(*s*-*b*)(*s*-*c*)   
      where *a*, *b*, *c* are the sides of the triangle and *s* = http://www.indiabix.com/_files/images/aptitude/1-div-1by2.gif(*a* + *b* + *c*).

|  |  |  |
| --- | --- | --- |
| 3.   Area of an equilateral triangle = | 3 | x (side)2. |
| 4 |

|  |  |  |
| --- | --- | --- |
| 4.   Radius of incircle of an equilateral triangle of side *a* = | *a* | . |
| 23 |

|  |  |  |
| --- | --- | --- |
| 5.   Radius of circumcircle of an equilateral triangle of side *a* = | *a* | . |
| 3 |

|  |  |
| --- | --- |
| 6.   Radius of incircle of a triangle of area http://www.indiabix.com/_files/images/aptitude/1-sym-tag.gif and semi-perimeter *s* = | http://www.indiabix.com/_files/images/aptitude/1-sym-tag.gif |
| *s* |

1. 1.   Area of parallelogram = (Base x Height).

2.   Area of a rhombus = http://www.indiabix.com/_files/images/aptitude/1-div-1by2.gif x (Product of diagonals).

3.   Area of a trapezium = http://www.indiabix.com/_files/images/aptitude/1-div-1by2.gif x (sum of parallel sides) x distance between them.

1. 1.   Area of a circle = http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gifR2, where R is the radius.

2.   Circumference of a circle = 2http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gifR.

|  |  |  |
| --- | --- | --- |
| 3.   Length of an arc = | 2http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gifRhttp://www.indiabix.com/_files/images/aptitude/1-sym-tta.gif | , where http://www.indiabix.com/_files/images/aptitude/1-sym-tta.gif is the central angle. |
| 360 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 4.   Area of a sector = | 1 | (arc x R) | = | http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gifR2http://www.indiabix.com/_files/images/aptitude/1-sym-tta.gif | . |
| 2 | 360 |

1. 1.   Circumference of a semi-circle = http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gifR.

|  |  |  |
| --- | --- | --- |
| 2.   Area of semi-circle = | http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gifR2 | . |
| 2 |

**Pipes :**

1. **Inlet:**

A pipe connected with a tank or a cistern or a reservoir, that fills it, is known as an inlet.

**Outlet:**

A pipe connected with a tank or cistern or reservoir, emptying it, is known as an outlet.

1. If a pipe can fill a tank in *x* hours, then:

|  |  |  |
| --- | --- | --- |
| part filled in 1 hour = | 1 | . |
| *x* |

1. If a pipe can empty a tank in *y* hours, then:

|  |  |  |
| --- | --- | --- |
| part emptied in 1 hour = | 1 | . |
| *y* |

1. If a pipe can fill a tank in *x* hours and another pipe can empty the full tank in *y* hours (where *y* > *x*), then on opening both the pipes, then

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| the net part filled in 1 hour = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | 1 | - | 1 | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | . |
| *x* | *y* |

1. If a pipe can fill a tank in *x* hours and another pipe can empty the full tank in *y* hours (where *x* > *y*), then on opening both the pipes, then

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| the net part emptied in 1 hour = | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | 1 | - | 1 | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | . |
| *y* | *x* |

**Logarithm :**

1. **Logarithm:**

If *a* is a positive real number, other than 1 and *am* = *x*, then we write:  
***m* = loga*x*** and we say that the value of log *x* to the base *a* is *m*.

**Examples:**

(i). 103 1000   http://www.indiabix.com/_files/images/aptitude/1-sym-imp.gif   log10 1000 = 3.

(ii). 34 = 81   http://www.indiabix.com/_files/images/aptitude/1-sym-imp.gif   log3 81 = 4.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (iii). 2-3 = | 1 | http://www.indiabix.com/_files/images/aptitude/1-sym-imp.gif   log2 | 1 | = -3. |
| 8 | 8 |

(iv). (.1)2 = .01   http://www.indiabix.com/_files/images/aptitude/1-sym-imp.gif   log(.1) .01 = 2.

1. **Properties of Logarithms:**

1. loga (*xy*) = loga *x* + loga *y*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2. loga | http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gif | *x* | http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif | = loga *x* - loga *y* |
| *y* |

3. logx *x* = 1

4. loga 1 = 0

5. loga (*xn*) = *n*(loga *x*)

|  |  |
| --- | --- |
| 6. loga *x* = | 1 |
| logx *a* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 7. loga *x* = | logb *x* | = | log *x* | . |
| logb *a* | log *a* |

1. **Common Logarithms:**

Logarithms to the base 10 are known as common logarithms.

1. The logarithm of a number contains two parts, namely 'characteristic' and 'mantissa'.

**Characteristic:** The internal part of the logarithm of a number is called its**characteristic.**

Case I: When the number is greater than 1.

In this case, the characteristic is one less than the number of digits in the left of the decimal point in the given number.

Case II: When the number is less than 1.

In this case, the characteristic is one more than the number of zeros between the decimal point and the first significant digit of the number and it is negative.

Instead of -1, -2 etc. we write 1 (one bar), 2 (two bar), etc.

Examples:-

|  |  |  |  |
| --- | --- | --- | --- |
| Number | Characteristic | Number | Characteristic |
| 654.24 | 2 | 0.6453 | 1 |
| 26.649 | 1 | 0.06134 | 2 |
| 8.3547 | 0 | 0.00123 | 3 |

**Mantissa:**

The decimal part of the logarithm of a number is known is its **mantissa.** For mantissa, we look through log table.

1. **Volume and surface CUBOID**

Let length = *l*, breadth = *b* and height = *h* units. Then

* 1. **Volume** = (*l* x *b* x *h*) cubic units.
  2. **Surface area** = 2(*lb* + *bh* + *lh*) sq. units.
  3. **Diagonal** = *l*2 + *b*2 + *h*2 units.

1. **CUBE**

Let each edge of a cube be of length *a*. Then,

* 1. **Volume** = *a*3 cubic units.
  2. **Surface area** = 6*a*2 sq. units.
  3. **Diagonal** = 3*a* units.

1. **CYLINDER**

Let radius of base = *r* and Height (or length) = *h*. Then,

* 1. **Volume** = (http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*2*h*) cubic units.
  2. **Curved surface area =** (2http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*rh*) sq. units.
  3. **Total surface area** = 2http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*(*h* + *r*) sq. units.

1. **CONE**

Let radius of base = *r* and Height = *h*. Then,

* 1. **Slant height,** *l* = *h*2 + *r*2 units.
  2. **Volume** = http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gifhttp://www.indiabix.com/_files/images/aptitude/1-div-1by3.gifhttp://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*2*h*http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif cubic units.
  3. **Curved surface area** = (http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*rl*) sq. units.
  4. **Total surface area** = (http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*rl* + http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*2) sq. units.

1. **SPHERE**

Let the radius of the sphere be *r*. Then,

* 1. **Volume** = http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gifhttp://www.indiabix.com/_files/images/aptitude/1-div-4by3.gifhttp://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*3http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif cubic units.
  2. **Surface area** = (4http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*2) sq. units.

1. **HEMISPHERE**

Let the radius of a hemisphere be *r*. Then,

* 1. **Volume** = http://www.indiabix.com/_files/images/aptitude/1-sym-oparen-h1.gifhttp://www.indiabix.com/_files/images/aptitude/1-div-2by3.gifhttp://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*3http://www.indiabix.com/_files/images/aptitude/1-sym-cparen-h1.gif cubic units.
  2. **Curved surface area** = (2http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*2) sq. units.
  3. **Total surface area** = (3http://www.indiabix.com/_files/images/aptitude/1-sym-pi.gif*r*2) sq. units.

Note: 1 litre = 1000 cm3.

**Simplification**

**'BODMAS' Rule:**

This rule depicts the correct sequence in which the operations are to be executed, so as to find out the value of given expression.

Here B - Bracket,   
O - of,   
D - Division,   
M - Multiplication,   
A - Addition and   
S - Subtraction

Thus, in simplifying an expression, first of all the brackets must be removed, strictly in the order (), {} and ||.

After removing the brackets, we must use the following operations strictly in the order:

(i) of (ii) Division (iii) Multiplication (iv) Addition (v) Subtraction.

