



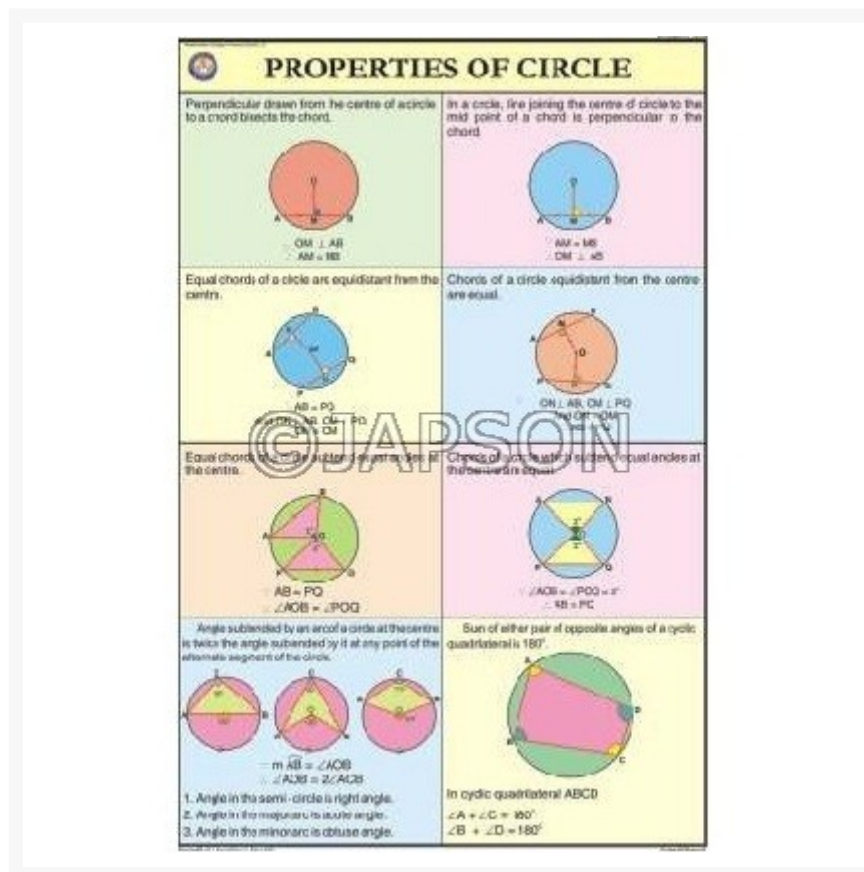
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JAMBU PERSHAD & SONS
6275/22 Nicholson Road,
Ambala Cantt, Haryana,
INDIA
Pin: 133001

Email:
sales@japson.com
japsonambala@yahoo.com

Website:
www.japson.com
Phone:
+91-171-4006897

Mathematics (Upper Primary) Charts, School Education

Product Image



Description

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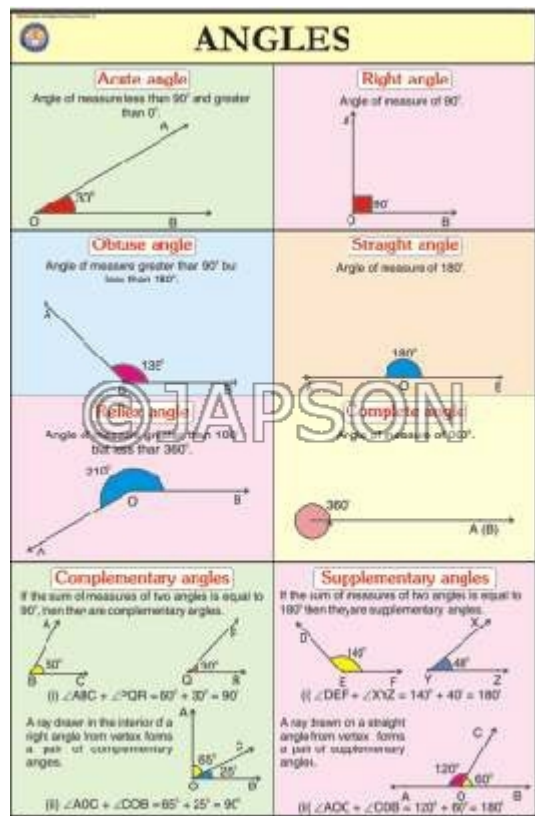
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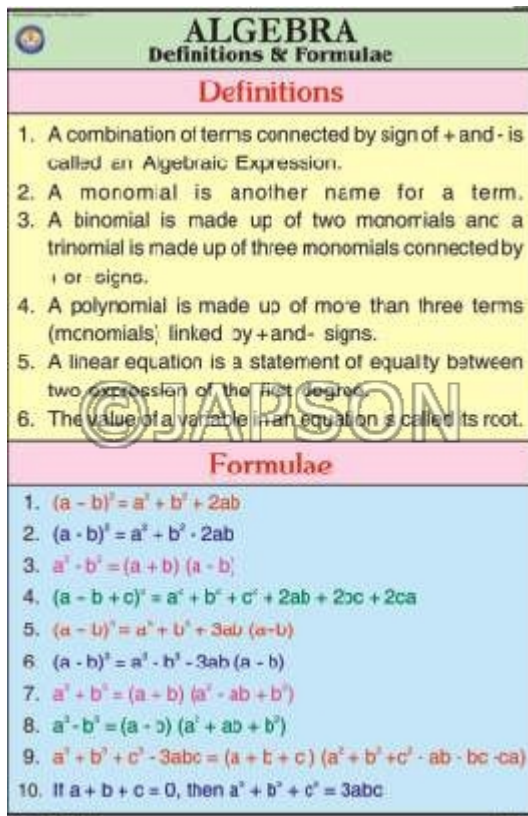
Laminated Paper Charts with Plastic Rollers. These Charts have technically accurate and detailed description in vivid colours.

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A. Charts, Angles



B. Charts, Algebra (Definitions & Formulae)



C. Charts, Number System

D. Charts, Triangles

| NUMBER SYSTEM | |
|--|--|
| Natural Numbers Counting numbers starting from 1. | 1 2 3 4 5 ... |
| Whole Numbers When zero is added to Natural numbers, it gives whole numbers. | 0 1 2 3 4 ... |
| Integers System of numbers containing whole numbers and negative of natural numbers is system of integers. | ... -3 -2 -1 0 1 2 3 |
| Rational Numbers A number in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$ is a rational number. | $\frac{100}{17}$ $\frac{21}{31}$ $-\frac{61}{19}$ 0 1 |
| Even Numbers Numbers exactly divisible by 2 are even numbers. Unit digit of even numbers is either 0, 2, 4, 6 or 8. | 22 164 198 100 8 100 |
| Odd Numbers Numbers which are not divisible by 2. Unit digit of odd numbers is either 1, 3, 5, 7 or 9. | 31 197 289 599 83 105 |
| Prime Numbers Numbers which have only two factors either 1 or the number itself. 2 is the smallest prime number. | 2 3 5 7 11 13 ... |
| Composite Numbers Numbers which have more than two factors. | 4 6 12 18 23 25 ... |

TRIANGLES

A CLOSED FIGURE MADE UP OF THREE LINE SEGMENTS & THREE ANGLES

WHAT TRIANGLES HAVE

- A. Three sides
- B. Three Angles
- C. Three vertices
- D. Total of 3 angles = 180°
- E. An exterior angle equals the sum of the two interior opposite angles
- F. The sum of any two sides of a triangle is greater than the third side.

WHAT TRIANGLES CANNOT HAVE

- A. Two right angles
- B. Two obtuse angles
- C. An angle = 90°
- D. An angle = 60°
- E. One obtuse and one right angle

Equilateral Triangle

All sides are equal
All angles are equal

Isosceles Triangle

Two sides are equal
Two angles are equal

Scalene Triangle

All sides are unequal
All angles are unequal

Acute Triangle

All angles less than 90°

Obtuse Triangle

One angle more than 90°

Right Triangle

One angle 90°

Pythagoras Theorem

In a right triangle, the square of the hypotenuse equals the sum of the squares of the other two sides.

The altitudes of a triangle are concurrent i.e. they meet at a point called orthocentre.
The three medians of a triangle are concurrent i.e. they meet at a point called centroid.
Angle bisector of a triangle are concurrent and meet at a point called incentre.
Perpendicular bisectors of three sides of a triangle are concurrent and meet at a point called circumcentre.

E. Charts, Profit & Loss

F. Charts, Congruent Triangles

| PROFIT & LOSS | |
|---------------|--|
| 1 | Gain = Selling Price - Cost Price when (Selling Price > Cost Price) |
| 2 | Loss = Cost Price - Selling Price when (Cost Price > Selling Price) |
| 3 | Gain % = $\frac{\text{Gain} \times 100}{\text{Cost Price}}$ |
| 4 | Loss % = $\frac{\text{Loss} \times 100}{\text{Cost Price}}$ |
| 5 | Selling Price = $\frac{(100 + \text{Gain \%}) \times \text{Cost Price}}{100}$ |
| 6 | Cost Price = $\frac{100 - \text{Loss \%} \times \text{Selling Price}}{100}$ |
| 7 | Cost Price = $\frac{\text{Selling Price} \times 100}{100 + \text{Gain \%}}$ |
| 8 | Cost Price = $\frac{\text{Selling Price} \times 100}{100 - \text{Loss \%}}$ |
| 9 | Discount = List Price - Selling Price |
| 10 | Discount Rate = $\text{Discount \%} = \frac{\text{Discount} \times 100}{\text{List Price}}$ |
| 11 | Selling Price = $\frac{\text{List Price} \times (100 - \text{Discount \%})}{100}$ |
| 12 | List Price = $\frac{100 \times \text{Selling Price}}{100 - \text{Discount \%}}$ |

CONGRUENT TRIANGLES

Two triangles are congruent if

- Their corresponding sides are equal.
- Their corresponding angles are equal.

SSS Congruence
If the corresponding sides of two triangles are equal, they are congruent.

SAS Congruence
If two sides and included angle of a triangle is equal to two corresponding sides and included angle of another triangle, then they are congruent.

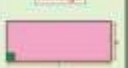



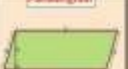



ASA Congruence
If two angles and included side of a triangle is equal to two corresponding angles and included side of another triangle, then they are congruent.

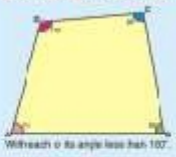



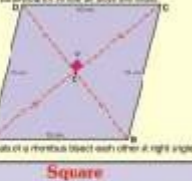
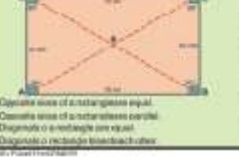

AAS Congruence
If two angles and a side of a triangle is equal to two corresponding angles and a corresponding side of another triangle, then they are congruent.

RHS Congruence
If the hypotenuse of a right triangle and a side is equal to the hypotenuse and a side of another right triangle, then they are congruent.



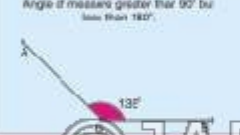


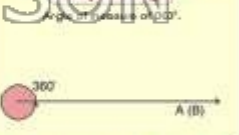
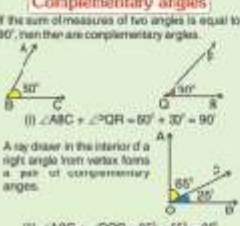
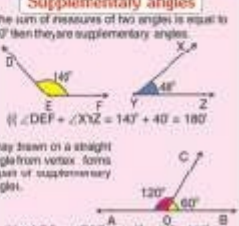
G. Charts, Mensuration-I

H. Charts, Quadrilaterals







| MENSURATION - I | | | |
|--|---|--------------------|--|
| Figure | Area | Perimeter | Illustrations |
|  | $l \times b$ | $2 \times (l + b)$ | l = length b = breadth |
|  | $s \times s$ | $4 \times s$ | s = side |
|  | $\frac{1}{2} \times d \times (h_1 + h_2)$ | $p + q + r + s$ | d = diagonal h_1, h_2 = altitudes p, q, r, s = sides |
|  | $\frac{1}{2} \times b \times h$ or $\frac{1}{2} (s_1 + s_2 + s_3) \times h$ | $a + b + c$ | h = altitude a, b, c = sides $s = \frac{a+b+c}{2}$ |
|  | $b \times h$ | $2 \times (a + b)$ | h = altitude a = side b = base |
|  | $\frac{1}{2} \times d_1 \times d_2$ or $h \times s$ | $4 \times s$ | d_1, d_2 = diagonal h = altitude s = side |
|  | $\frac{1}{2} \times (a + b) \times h$ | $a + b + c + d$ | a, b = parallel sides c, d = non-parallel sides h = altitude |
|  | πr^2 | $2\pi r$ | $\pi = 3.14$ or $\frac{22}{7}$ r = radius |

| QUADRILATERALS | |
|--|--|
| Closed Figure made up of four line segments | |
| Properties of Quadrilaterals <ol style="list-style-type: none"> Vertices A, B, C, D are called the vertices of the quadrilateral. Line segments AB, BC, CD, DA are called the Sides of the quadrilateral. Four angles of the quadrilateral ABCD are $\angle A, \angle B, \angle C, \angle D$. The two line segments joining two opposite vertices are called diagonals. The sum of the angles of a quadrilateral is 360°. | Convex Quadrilateral  <p>With each of its angle less than 180°.</p> |
| Concave Quadrilateral  | Trapezium  <p>A quadrilateral with one pair of opposite sides parallel.</p> |
| Parallelogram  <p>A quadrilateral with both the pairs of opposite sides parallel.</p> <ol style="list-style-type: none"> The opposite sides of a parallelogram are equal and parallel. The opposite angles of a parallelogram are equal. The diagonals of a parallelogram bisect each other. | Rhombus  <p>A parallelogram whose all sides are equal.</p> <p>The diagonals of a rhombus bisect each other at right angle.</p> |
| Rectangle  <p>A parallelogram with each of its angle a right angle.</p> <ol style="list-style-type: none"> Opposite sides of a rectangle are equal. Opposite angles of a rectangle are equal. The diagonals of a rectangle are equal. The diagonals of a rectangle bisect each other. | Square  <p>A rhombus with all the angles right angle or a rectangle with all the sides equal.</p> <ol style="list-style-type: none"> Perimeter is equal to $4 \times \text{side}$. Area of a square is $\text{side} \times \text{side}$ or s^2. Each angle of a square is right angle. The diagonals of a square bisect each other at right angle. |

I. Charts, Angles

| ANGLES | |
|--|--|
| Acute angle Angle of measure less than 90° and greater than 0° .  | Right angle Angle of measure of 90° .  |
| Obtuse angle Angle of measure greater than 90° but less than 180° .  | Straight angle Angle of measure of 180° .  |
| Reflex angle Angle of measure greater than 180° but less than 360° .  | Complete angle Angle of measure of 360° .  |
| Complementary angles If the sum of measures of two angles is equal to 90° , then they are complementary angles.  <p>(i) $\angle ABC + \angle PQR = 60^\circ + 30^\circ = 90^\circ$</p> <p>A ray drawn in the interior of a right angle from vertex forms a pair of complementary angles.</p> <p>(ii) $\angle AOC + \angle COB = 65^\circ + 25^\circ = 90^\circ$</p> | Supplementary angles If the sum of measures of two angles is equal to 180° then they are supplementary angles.  <p>(i) $\angle DEF + \angle XYZ = 140^\circ + 40^\circ = 180^\circ$</p> <p>A ray drawn on a straight angle from vertex forms a pair of supplementary angles.</p> <p>(ii) $\angle AOC + \angle COB = 120^\circ + 60^\circ = 180^\circ$</p> |

J. Charts, Mensuration - II

| Figure | Lateral Surface Area | Total Surface Area | Volume | Illustrations |
|---|----------------------|--------------------|-------------------------|--|
|  | $2(l + b) \times h$ | $2(lb + bh + lh)$ | lbh | l = length b = breadth h = height |
|  | $4s^2$ | $6s^2$ | s^3 | s = side |
|  | $2\pi r h$ | $2\pi r(l + r)$ | $\pi r^2 h$ | $\pi = 3.14$ or $\frac{22}{7}$ r = Radius h = height |
|  | $\pi r l$ | $\pi r(l + r)$ | $\frac{1}{3} \pi r^2 h$ | $\pi = 3.14$ or $\frac{22}{7}$ r = Radius h = height $l = \sqrt{r^2 + h^2}$ |
|  | — | $4\pi r^2$ | $\frac{4}{3} \pi r^3$ | $\pi = 3.14$ or $\frac{22}{7}$ r = Radius |
|  | $2\pi r^2$ | $3\pi r^2$ | $\frac{2}{3} \pi r^3$ | $\pi = 3.14$ or $\frac{22}{7}$ r = Radius |

K. Charts, Multiplication Of Rational Numbers

L. Charts, Some Geometrical Concepts

| MULTIPLICATION OF RATIONAL NUMBERS | |
|------------------------------------|--|
| 1 | Closure Property :- The product of two rational numbers is always a rational number. If a and b are two rational numbers and $a \times b = c$, then c is also a rational number. |
| 2 | Commutative Property :- Two rational numbers can be multiplied in any order. If a and b are two rational numbers then $a \times b = b \times a$. |
| 3 | Associative Property :- Three or more rational numbers can be grouped in any order for multiplication. If a, b and c are three rational numbers then $a \times (b \times c) = (a \times b) \times c$. |
| 4 | Identity Element :- The product of any rational numbers and 1 is the rational number itself. If a is a rational number then $a \times 1 = 1 \times a = a$. Therefore 1 is identity element for multiplication. |
| 5 | Multiplication with 0 :- Any rational number multiplied by 0 is equal to 0. If a is a rational number then $a \times 0 = 0 \times a = 0$. |
| DIVISION OF RATIONAL NUMBERS | |
| 6 | Closure Property :- The division of two rational numbers is always a rational number. If a and b are two rational numbers and $a \div b = c$, then c is also a rational number, $b \neq 0$. |
| 7 | Division is not Commutative :- If a and b are two rational numbers then $a \div b \neq b \div a$. |
| 8 | Division is not Associative :- If a, b and c are three rational numbers then, $(a \div b) \div c \neq a \div (b \div c)$. |
| 9 | Division by 1 :- If a is a rational number then $a \div 1 = a$ and $1 \div a = \frac{1}{a} \neq a$. |
| 10 | Division by 0 :- If a is a rational number then $a \div 0$ is not possible and $0 \div a = 0$. |
| 11 | If a, b and c are three rational numbers then 1. $a \div (b \times c) = a \div b \times a \div c = (b \times c) \div a$ 2. $a \div (b \div c) = a \div b \times c = (b \div c) \times a$ 3. $(a \times b) \div c = a \div c \times b \div c = (a \div c) \times (b \div c)$ 4. $(a \div b) \times c = a \div c \times b \div c = (a \div c) \times (b \div c)$ |

| SOME GEOMETRICAL CONCEPTS | |
|---|---|
| Point A dot having no length, width or depth, only fixed position is a point. It is represented by capital letters. | Line Line is a set of continuous points which extends indefinitely. It has only width, no length and no end points. It is represented by small letters written on one side. |
| Line Segment It is a part of a line. It has two end points. It has fixed length. | Ray A ray is a part of a line which has one end point. It extends indefinitely in one direction. It has no fixed length. |
| Collinear Points Three or more points lying on a same line are called Collinear Points. Points A, B, C, D, P, Q and R are collinear. | Non - Collinear Points Points not lying on the same line are Non-Collinear points. |
| Concurrent Lines Three or more lines passing through the same point are concurrent lines. Point of intersection is called point of concurrence. | Non - Concurrent Lines Three or more lines which do not pass through the same point are non-concurrent lines. |
| Perpendicular Lines Lines intersecting each other at right angles. | Parallel Lines Two straight lines that are at the same distance and which do not meet each other are called parallel lines. |
| Intersecting Lines Lines which meet each other at a point are called intersecting lines. Point of meeting is called point of intersection. | Perpendicular Bisector A line which bisects a line segment at right angles. |

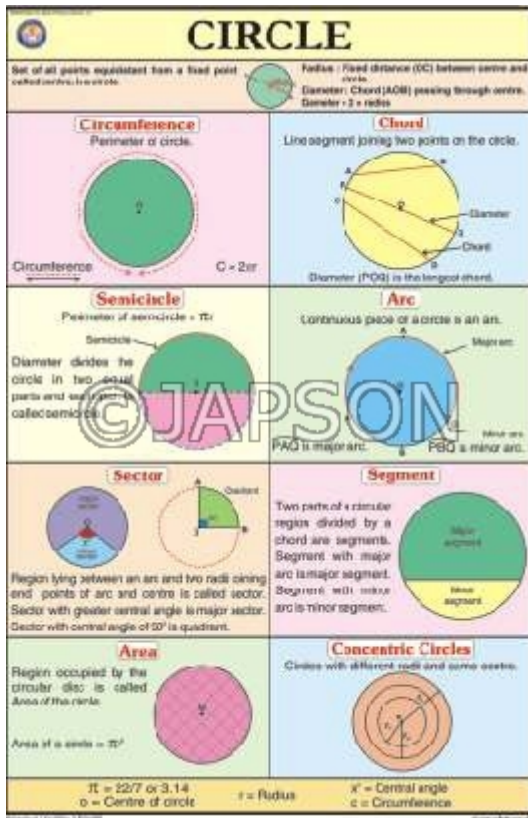
M. Charts, Properties Of Circle

N. Charts, Addition Of Rational Numbers

| PROPERTIES OF CIRCLE | |
|---|---|
| Perpendicular drawn from the centre of a circle to a chord bisects the chord. | In a circle, line joining the centre of circle to the mid point of a chord is perpendicular to the chord. |
| Equal chords of a circle are equidistant from the centre. | Chords of a circle equidistant from the centre are equal. |
| Equal chords of a circle subtend equal angles at the centre. | Chords of a circle which subtend equal angles at the centre are equal. |
| Angle subtended by an arc of a circle at the centre is twice the angle subtended by it at any point of the alternate segment of the circle. | Sum of either pair of opposite angles of a cyclic quadrilateral is 180°. |
| 1. Angle in the semi-circle is right angle. 2. Angles in the same segment are equal angles. 3. Angle in the minor arc is obtuse angle. | In cyclic quadrilateral ABCD $\angle A + \angle C = 180^\circ$ $\angle B + \angle D = 180^\circ$ |

| ADDITION OF RATIONAL NUMBERS | |
|---------------------------------|---|
| 1 | Closure Property :- The sum of two rational numbers is always a rational number. If a and b are two rational numbers and $a + b = c$, then c is also a rational number. |
| 2 | Commutative Property :- Two rational numbers can be added in any order. If a and b are two rational numbers then $a + b = b + a$. |
| 3 | Associative Property :- Three rational numbers to be added can be grouped in any order. If a, b and c are three rational numbers then $(a + b) + c = a + (b + c)$. |
| 4 | Addition of Zero :- The sum of any rational number and zero is the rational number itself. 0 is a rational number such that for every rational number a , $a + 0 = 0 + a = a$. |
| 5 | Additive Inverse :- The negative of a rational number added to it makes 0. So, the + and - signs of a rational number are called the additive inverse of each other. For rational number a and $-a$, $a + (-a) = (-a) + a = 0$ is true. $-a$ is additive inverse of a . |
| SUBTRACTION OF RATIONAL NUMBERS | |
| 6 | Closure Property :- The difference of two rational numbers is a rational number. If a and b are two rational numbers and $a - b = c$ then c is also a rational number. |
| 7 | Subtraction is not Commutative :- If a and b are two rational numbers and $a \neq b$, then $a - b \neq b - a$. If $a = b$, then $a - b = b - a = 0$. |
| 8 | Subtraction is not Associative :- If a, b and c are three rational numbers then $(a - b) - c \neq a - (b - c)$, $c \neq 0$. |
| 9 | Subtraction with Zero :- If a is a rational number then $a - 0 = a$ but $0 - a = -a$. |

O. Charts, Circle



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