

SAMPLE PAPER – 2009
CLASS – IX
SUBJECT – MATHEMATICS

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper consists of 30 questions divided into four sections – A, B, C and D. Section A contains 10 questions of 1 mark each, Section B contains 5 Questions of 2 marks each, Section C contains 10 questions of 3 marks each and section D contains 5 questions of 6 marks each.
- (iii) There is no overall choice. However, an internal choice has been Provided in one question of two marks each, three questions of three marks each and two questions of six marks each.
- (iv) Use of calculator is not permitted.

SECTION A (10 x 1 = 10 marks)

- Q.1 Find the value of 'k', if $x - 1$ is a factor of $2x^2 + kx + \sqrt{2}$
- Q.2 If $x + y + z = 0$, show that $x^3 + y^3 + z^3 = 3xyz$.
- Q.3 Three angles of a quadrilateral measure 56° , 115° and 84° . Find the measure of the fourth angle.
- Q.4 Two unbiased coins are tossed once. What is the probability of getting exactly one head?
- Q.5 Find the remainder when $x^3 - ax^2 + 6x - a$ is divided by $x - a$.
- Q.6 In which quadrant do these points $(-2,4)$, $(3,-1)$, $(-3, 8)$, $(4, -5)$ lie?
- Q.7 Find the volume of a right circular cylinder which has a height of 21cm and base radius 5cm.
- Q.8 Express 1.623 as a rational number in the form p/q .
- Q.9 A right triangle ABC with sides 5 cm, 12cm and 13 cm is revolved about the side 12 cm. Find the volume of the solid so formed.
- Q.10 If the mean of five observations x , $x + 2$, $x + 4$, $x + 6$ and $x + 8$ is 11. Find the mean of the first three observations.

SECTION – B (5 x 2 = 10 marks)

Q.11 Find the area of a triangle two side of which are 18 cm and 10 cm and the perimeter is 42cm.

Q.12 Simplify:

$$(3\sqrt{7} + 8\sqrt{5}) \times (7\sqrt{7} - 9\sqrt{5})$$

Q.13 Rationalise:

$$\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}}$$

Q.14 curved surface area of a right circular cylindrical is 4.4 m^2 . If the radius of the base of the cylinder is 0.7m, Find its height.

OR

A sphere of diameter 15.6cm, is melted and cast into a right circular cone of height 31.2 cm. Find the diameter of the base of the cone.

Q.15 A bag contains 4 red, 5 black and 6 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is;

- a. either red or white b. neither black nor red
c. Red and white d. Red or white or black

SECTION – C (10 x 3 = 30 marks)

Q.16 Find mean of the following data.

lasses	0-50	50-100	100-150	150-200	200-250	250-300
frequencies	4	10	12	10	8	6

Q.17 Verify that $x^3 + y^3 + z^3 - 3xyz = \frac{1}{2} (x + y + z)$

$$[(x - y)^2 + (y - z)^2 + (z - x)^2]$$

OR

Factorise by using factor theorem.

(i) $x^3 - 2x^2 - x + 2$ (ii) $x^3 - 3x^2 - 9x - 5$

Q.18 Draw the graph of the equation $2x + y = 6$. Find the coordinates of the point where the graph cuts the x- axis.

Q.19 The length, breadth and height of a room are 5 m, 4 m and 3 m respectively. Find the cost of white washing the walls of the room and the ceiling at the rate of 7.50 per m^2 .

Q.20 Show that the each angle of a equilateral triangle is 60° .

OR

ABC is a right triangle in which $\angle A = 90^\circ$ and $AB = AC$. Find $\angle B$ and $\angle C$.

Q.21 A card is drawn at random from a well-shuffled deck of 52 cards. Find the probability of getting:

- (i) a red king or an ace (ii) '2' of black suit

(iii) neither a king nor a queen (iv) a black face card

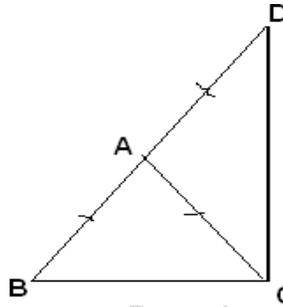
Q.22 BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule, prove that the triangle ABC is isosceles.

Q.23 Simplify :

a) $(2x+y-z)^2 - (2x-y+z)^2$

b) $(4x+2y)^3 + (4x-2y)^3$

Q.24 $\triangle ABC$ is an isosceles triangle in which $AB = AC$. Side BA is produced to D such that $AD = AB$. Show that $\angle BCD$ is a right angle.



Q.25 Prove that angles opposite to equal sides of an isosceles triangle are equal.

OR

Prove that if a side of a triangle is produced, then the exterior angle so formed is equal to the sum of the two interior opposite angles.

SECTION - D (5 x 6 = 30 marks)

Q.26 From a solid right circular cylindrical with height 10 cm and radius of the base 6 cm, a right circular cone of the same height and base is removed. Find the volume of the remaining solid.

Q.27 A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter 4.4 cm. Find its

- (i) inner curved surface area,
- (ii) outer curved surface area,
- (iii) total surface area.

Q.28 A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 26cm, 28cm, and 30cm, and the parallelogram stands on the base 28cm, find height of the parallelogram.

OR

A park, in the shape of a quadrilateral ABCD, has $\angle C = 90^\circ$, $AB = 9$ m, $BC = 12$ m, $CD = 5$ m and $AD = 8$ m. How much area does it occupy?

Q.29 Find the missing frequencies in the following distribution. It is given that mean of the Frequency distribution is 50.

Also find mode.

Class	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100	Total
f	17	F_1	32	F_2	19	120

Q.30 Prove that sum of three angles of a triangle is 180° .

Using this:

find the value of 'x' if three angles of the triangle are $(2x-7)^\circ$, $(x+25)^\circ$, $(3x+12)^\circ$.

OR

Prove that the line segment joining the mid point of two sides of a triangle is parallel to the third and half of it.