

ANNUAL EXAM 2022-23
Class IX Mathematics

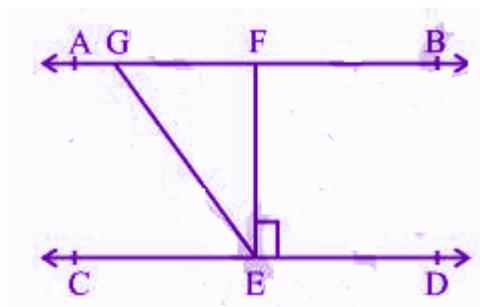
Time 3 hrs

MM- 80

Note: All questions are compulsory; marks are indicated under the section.

Section –A(each question carries 01 mark)

1. Which graph is parallel to x-axis?
(a) $y=x+1$ (b) $y=2$ (c) $x=3$ (d) $x=2y$
2. Which point lies on x-axis?
(a) (3, 2) (b) (-3, 2) (c) (2, 0) (d) (-1,-2)
3. What is the median of the data 78, 56, 22, 34, 45, 54, 39, 68, 54, 84?
(a) 54 (b) 53 (c) 55 (d) 51
4. The number of zeros of a polynomial $x^2 + 4x + 2$ is
(a) 1 (b) 2 (c) 3 (d) none of these
5. The polynomial of type $ax^2 + bx + c$, $a = 0$ is of type
(a) linear (b) quadratic (c) cubic (d) Biquadratic
6. If $x + 2$ is a factor of $x^3 - 2ax^2 + 16$, then value of a is
(a) 3 (b) 1 (c) 4 (d) 2
7. If in a parallelogram its diagonals bisect each other at right angles and are equal, then it is a
I. Square II. Rectangle III. Rhombus IV. Parallelogram
8. A quadrilateral with only one pair of opposite sides parallel is called:
I. Trapezium II. Square III. Rectangle IV. Rhombus
9. The number $(3-\sqrt{3})(3+\sqrt{3})$ is
(a) an irrational number (b) a rational number
(c) not a natural number (d) none of these
10. On simplifying $8^3 \times 2^4$ we get
(a) 16^7 (b) 2^{13} (c) 2^{10} (d) 8^4
11. The number 1.101001000100001... is
(a) a natural number (b) a whole number
(c) a rational number (d) an irrational number
12. Distance of a point A(-4,-5) from X axis is
a. 4 unit b. 5 unit c. -4 unit d.-5 unit
13. If two complementary angles are in the ratio 13 : 5, then the angles are:
a) $13x^\circ$, $5x^\circ$ b) 25° , 65° c) 65° , 25° d) 65° , 35°
14. If $AB \parallel CD$, $EF \perp CD$ and $\angle GED = 135^\circ$ as per the figure given below.



The value of $\angle AGE$ is:

a) 120°

b) 140°

c) 90°

d) 135°

15. The volume of hemisphere whose radius is r , is:

a. $\frac{4}{3} \pi r^3$

b. $4\pi r^3$

c. $2\pi r^3$

d. $\frac{2}{3} \pi r^3$

16. If the radius of a sphere is doubled, then its volume will become

a. same

b. double

c. four times

d. 8 times

17. The longest chord of the circle is:

a. Radius

b. Arc

c. Diameter

d. Segment

18. The mode of the given data: 4, 6, 5, 9, 3, 2, 7, 7, 6, 5, 4, 9, 10, 10, 3, 4, 7, 6, 9, 9 is;

a. 7

b. 9

c. 10

d. 6

19. The mean of $x+2$, $x+3$, $x+4$ and $x-2$ is:

a. $(x+7)/4$

b. $(2x+7)/4$

c. $(3x+7)/4$

d. $(4x+7)/4$

20. If volume and surface area of sphere are numerically equal then its radius is

a. 3 unit

b. 4 unit

c. 2 unit

d. none of these

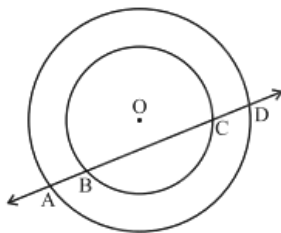
Section B (each question carries 2 marks)

21. Rationalise the denominator of $\frac{1}{\sqrt{3}-\sqrt{2}}$

22. Write 2.53 in the form of $\frac{p}{q}$

23. Write *identity* $(a + b + c)^2$ and then Expand $(2x - y + z)^2$

24. prove that $AB = CD$, in the given concentric circles



25. Marks of top 20 students are given below, find the mean marks of the following data

Marks	16	17	18	19	20
No of students	3	5	2	6	4

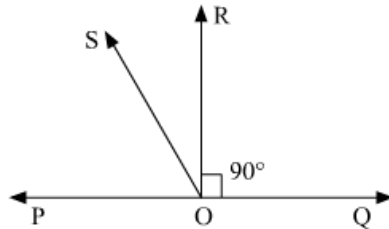
Section C (each question carries 3 marks)

26. Represent $\sqrt{8.6}$ on number line. (step of construction need not to be written)

27. In which quadrant or on which axis the following point lie

A (2, -3) B (-3,4) C (-4,0) D (0, -5) E (-2, -3) F (2,4)

28. In the given figure, POQ is a line. Ray OR is perpendicular to line PQ . OS is another ray lying between rays OP and OR . Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$.



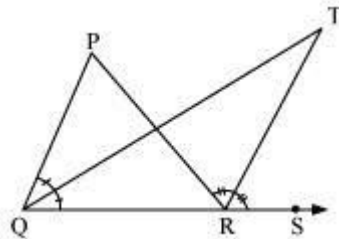
29. If diagonals of a parallelogram are equal then show that it is a rectangle.

30. The diameter of a moon is approximately one sixth of the diameter of a earth ,find the ratio of (i) surface area (ii) Volume

31. Two circles having radii 5 cm and 3 cm intersect each other at two distinct points. If the distance between their centres is 4 cm, then what is the length of the common chord.

Section D (each question carries 5 marks)

32. In fig ,the side QR of triangle PQR is produced to a point S. If the bisectors of $\angle PQR$ and $\angle$ meet at point T, then prove that $\angle QTR = \frac{1}{2} \angle QPR$.



Or

In figure PQ and RS are two mirrors placed parallel to each other .An incident ray AB strikes the mirror PQ at B and reflected ray moves along the path BC and strikes the mirror RS at C and again reflects back along CD. Prove that $AB \parallel CD$

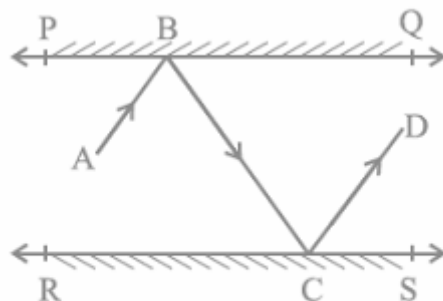


Fig. 6.33

33. State and prove mid-point theorem.

34. Prove that $x^3+y^3+z^3=3xyz$, if $x+y+z=0$. using above identity find the value of $(-15)^3+(7)^3+(8)^3$.

Or

Factorise : $x^3 - 23x^2 + 142x - 120$

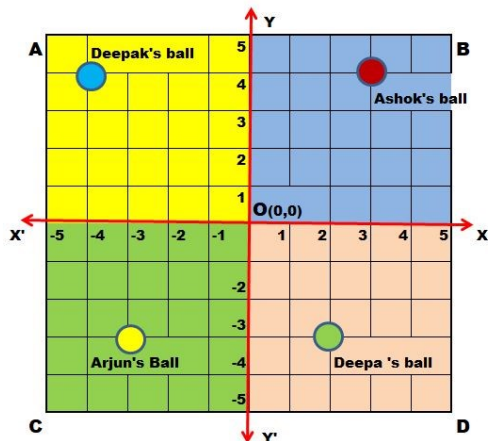
35. Height of 50 students of class 9 are given below. Draw histogram and frequency polygon of the given data.

Height (in cm)	120-130	130-140	140-150	150-160	160-170	170-180
No of students	8	9	11	12	7	3

Section E (Each case study carries 4 marks)

Case study question 1

Read the Source/Text given below and answer any four questions:



There is a square park ABCD in the middle of Saket colony in Delhi. Four children Deepak, Ashok, Arjun and Deepa went to play with their balls. The colour of the ball of Ashok, Deepak, Arjun and Deepa are red, blue, yellow and green respectively.

All four children roll their ball from centre point O in the direction of XOY , $X'OY$, $X'OY'$ and XOY' .

Their balls stopped as shown in the above image.

Answer the following questions:

- What are the coordinates of the ball of Ashok?
 - (4, 3)
 - (3, 4)
 - (4, 4)
 - (3, 3)
- What are the coordinates of the ball of Deepa?
 - (2, -3)
 - (3, 2)
 - (2, 3)
 - (2, 2)
- What the line XOX' is called?
 - y-axis
 - ordinate
 - x-axis
 - origin
- What the point O (0,0) is called?
 - y-axis
 - ordinate
 - x-axis
 - origin
- What is the ordinate of the ball of Arjun?
 - 3
 - 3
 - 4
 - 2

Case study question 2

Too different students were given equal amount of clay to make model of solid shapes. Mohan made a spherical ball of radius 7cm and measured its volume and surface area, whereas Ravi made a cone of radius 7cm and measured the height.

Answer the following (1+1+2)

- Which formula Mohan used to find volume of clay
- Which formula Mohan used to find surface Area
- What is height of Ravi's model

Case study question 3

Three shops are there on a circular path of radius 5m with centre o. shortest distance from shop A to B is 6m from B to C is 6m find.

- Whether OB is perpendicular bisector of AC justify
- Find the shortest distance from shop A to C (Length AC)