International Indian School Jeddah

Half Yearly Examination Oct./Nov. 2022

Subject: Mathematics

Class: 9   Marks: 80

No. of pages: 9   Duration: 3 hrs.

General Instructions:

Section A consists of 20 MCQ carries 1 mark each.

Section B consists of 5 questions of 2 marks each.

Section C consists of 6 questions of 3 marks each.

Section D consists of 3 questions of 4 marks each. (Case Study Based)

Section E consists of 4 questions of 5 marks each.

All questions are compulsory.

Section A

Choose the correct answer:

1. Which one of the following is a rational number?

   a. $\sqrt{3}$ b. $\sqrt{2}$ c. $\sqrt{5}$ d. $\sqrt{4}$

2. The value of $(3+\sqrt{3})(2+\sqrt{2})$ is ……………

    a. $6 + 3\sqrt{2} + 2\sqrt{3} + \sqrt{6}$ b. $3 + 3\sqrt{2} + 3\sqrt{3} + 6$

    c. $6 - 3\sqrt{2} - 2\sqrt{3} - \sqrt{6}$ d. $6 - \sqrt{6}$

3. The value $(125)^{2/3}$ is ………….

    a. 5 b. 25 c. 45 d. 125

4. Point (5,0) lies in / on the ……….

   a. I quadrant   b. II quadrant   c. x-axis   d. y-axis

5. The perpendicular distance of the point P (3,4) from the y-axis is …….

   a. 3 units   b. 4 units   c. 5 units   d. 7 units

6. The point of intersection of the coordinate axes is called ……….

   a. Quadrant   b. ordinate   c. Origin   d. abscissa

7. If (2,0) is a solution of the linear equation $2x + 3y = k$, then the value of 'k' is …….

   a. 4   b. 6   c. 5   d. 2

8. Any point on the x-axis is of the form………

   a. (x,y)   b. (o,y)   c. (x,0)   d. (0,0)

9. Two adjacent angles on a straight line are in the ratio 5:4, then the measure of each one of these angles are………..

   a. 100^0 and 80^0 b. 75^0 and 105^0 c. 90^0 and 90^0 d. 60^0 and 120^0

10. If a ray stands on a line, then the sum of two adjacent angles so formed is ….

    a. 90^0 b. 180^0 c. 360^0 d. 45^0

11. In the given figure, if AB//CD, then x + y is …………
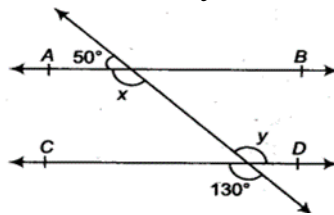
    a. 180^0 b. 260^0 c. 80^0 d. 100^0

12. The measure of each angle of an equilateral triangle is …

   a. 60^0 b. 30^0 c. 45^0 d. 180^0

13. The sum of the angles of a linear pair is …..

   a. 90^0 b. 45^0 c. 360^0 d. 180^0

14. If the vertex angle of an isosceles triangle is 40^0, then measure of the other two angles will be …..

   a. $60^0, 60^0$ b. $50^0, 50^0$ c. $70^0, 70^0$ d. $55^0, 55^0$

15. Semi-perimeter of a triangle whose sides are a, b and c is …….

   a. $\frac{a+b+c}{3}$ b. $\frac{a+b+c}{2}$ c. (a+b+c)   d. none of these

16. The sides of a triangle are 3 cm, 4 cm and 5 cm. Its area is ……….

   a. 12 cm^2 b. 15 cm^2 c. 6 cm^2 d. 9 cm^2

17. Class mark of class 150 – 160 is …….

a. 150   b. 160   c. 155   d. 10

18. For drawing a frequency polygon of a continuous frequency distribution, we plot the points whose ordinates are the frequency of the respective classes and abscissa respectively…..

   a.   Upper limits of the classes   b. lower limits of the classes
   c. class marks of the classes   d. upper limits of preceding classes

19. Assertion : There are infinite number of lines which passes through (3, 2).
   Reason: A linear equation in two variables has infinitely many solutions.

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true but reason is not the correct explanation of assertion.

(C) Assertion is true but reason is false.

(d) Assertion is false but reason is true.

20. Assertion: the area of a triangle is 6 cm^2 whose sides are 3 cm, 4 cm and 5 cm respectively.

Reason: area of triangle= $\sqrt{s(s-a)(s-b)(s-c)}$

a) both Assertion and reason are correct and reason is correct explanation for Assertion

b) both Assertion and reason are correct but reason is not correct explanation for Assertion

c) Assertion is true but reason is false.

d) both Assertion and reason are false.

Section – B

21. Simplify: $\dfrac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}}$

(OR)

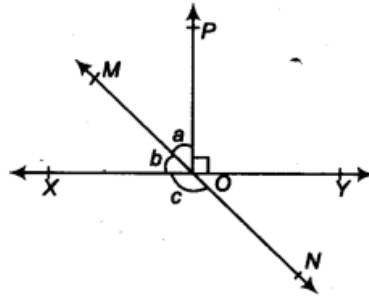Rationalize the denominator of $\dfrac{7}{7-4\sqrt{3}}$

22. In which quadrant or on which axis do each of the points P(-2,5), Q(1,3), R(-5,-6) and S(0,-4) lie?

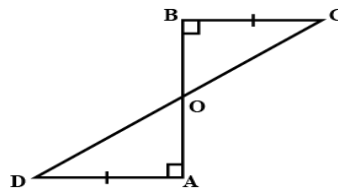23. Find any two solutions of $2x + 3y = 6$.

24. If two straight lines intersect each other, then prove that the vertically opposite angles are equal.

(OR)

Find the angle 'c', if a:b = 3:2

25. AD and BC are equal perpendiculars to a line segment AB. Show that CD bisects AB.

Section – C

26. Express $1.23\overline{7}$ in the form of p/q, where p and q are integers and q $\neq$ 0.

27. The taxi fare in a city as follows: For the first kilometer, the fare is Rs 50 and for the subsequent distance it is Rs 15 per km. Taking the distance covered as x km and total fare as Rs y, write a linear equation for this information, and calculate the taxi fare for a travel of 100 kms.

(OR)

The auto rickshaw charge in a city as follows: For the first kilometer, the fare is Rs 25 and for the subsequent distance it is Rs 10 per km. Taking the distance covered as x km and total fare as Rs y, write a linear equation for this information, and calculate the charge for a travel of 50 kms.
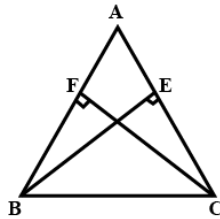
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28. In the figure, if AOB is a line, OP bisects ∠BOC and OQ bisects ∠AOC. Show that ∠POQ is a right angle.
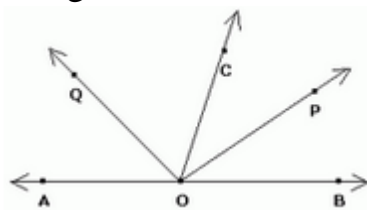
29. In figure., line AB and CD intersect at O. If $\angle AOC + \angle BOE = 70^0$ and $\angle BOD = 40^0$. Find $\angle BOE$ and reflex $\angle COE$.
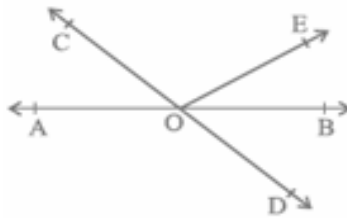
30. ABC is an isosceles triangle in which altitudes BE and CF are drawn to equal sides AC and AB respectively. Show that these altitudes are equal.

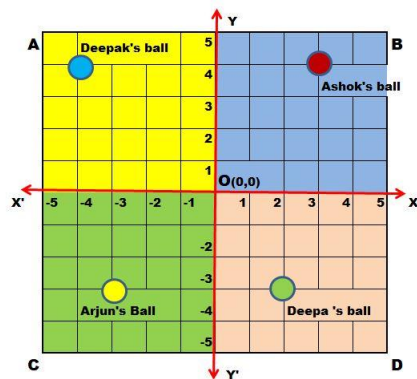31. Find the area of a triangle, two sides of which are 8 cm and 11 cm and the perimeter is 32 cm.

(OR)

An isosceles triangle has perimeter 30 cm and each of the equal sides is 12 cm. Find the area of the triangle.

Section – D

(Case Study Based Questions)

32. Case Study - 1:

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:

   i. What are the coordinates of the ball of Ashok?   (1m)
     a. (4, 3)   b. (3, 4)   c. (4, 4)   d. (3, 3)

   ii. What are the coordinates of the ball of Deepa?   (1m)
     b. (2, -3)   b. (3, 2)   c. (2, 3)   d. (2, 2)

   iii. What is the point of intersection of the coordinate axes?   (2m)
     And what are the coordinates of the same?
                       (OR)
     Identify the quadrant where the red ball lies in.
     Find the abscissa of the same.

33. Case Study - 2:

In a city, the weekly observations made in a study on the cost-of-living index are given in the following table:

Cost of living index	Number of weeks
140 – 150	5
150 – 160	10
160 – 170	20
170 – 180	9
180 – 190	6
190 - 200	2

   i. The class mark of the interval 160 – 170 is ……..   (1m)
     a. 10   b. 5   c. 165   d. 160

   ii. The class size of the class interval 140 – 150 is …..   (1m)
     a. 10   b. 5   c. 290   d. 145

   iii. Find the lower and the upper limit of the interval 180-190.   (2m)
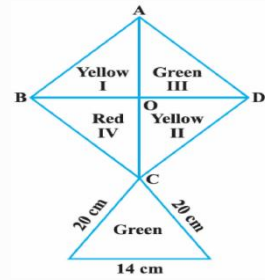   Also find the frequency of the same interval.
                       (OR)
     Identify the interval, where the class mark is 175.
     Also find the frequency of the same interval.

34. Case Study - 3:

According to the figure, AC = BD = 44 cm, AO = BO = 22 cm.
AC and BD are perpendicular bisectors to each other.

i. The semi-perimeter of the triangle whose sides are 20 cm, 20 cm and 14 cm is
   a. 54 cm   b. 27 cm   c. 20 cm   d. 14 cm   (1m)

ii. Area of an equilateral triangle of side 'a' unit is ….   (1m)
   a. $\dfrac{\sqrt{3}}{2}\,a^2$ b. $\dfrac{\sqrt{3}}{4}\,a$ c. $\dfrac{\sqrt{3}}{4}\,a^2$ d. none of these

iii. Find the area of the triangle ABD in the given figure.   (2m)
                               (OR)
    Find the area of the triangle BOC in the given figure.

Section – E

35. If $\dfrac{7-\sqrt{5}}{7+\sqrt{5}} = a + b\sqrt{5}$, then find the value of a and b.

36. $F = \dfrac{9}{5}C + 32$, is the relationship between the Celsius and Fahrenheit unit.

  (i) Find 40^0 C in Fahrenheit unit.

 (ii) Find the temperature which is numerically the same in both Fahrenheit and

     Celsius.

37. AB is a line segment and P is its mid-point. D and E are points on the same

   side of AB such that ∠BAD = ∠ABE and ∠EPA = ∠DPB.
   Show that (i) △DAP ≅ △EBP and (ii) AD = BE.
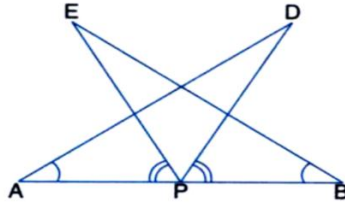
(OR)

Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of $\triangle$PQR.
Show that: (i) $\triangle$ABM $\cong$ $\triangle$PQN   (ii) $\triangle$ABC $\cong$ $\triangle$PQR.
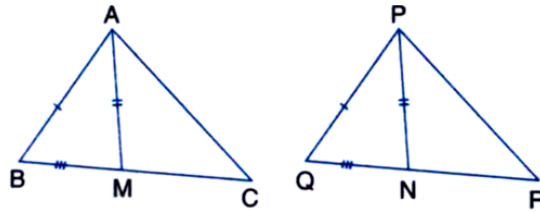
38. Draw a histogram and frequency polygon on the same graph for the following data.

Class Interval	Frequency
150-200	5
200-250	3
250-300	5
300-350	6
350-400	8
400-450	7
450-500	1

(OR)

100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the surnames was found as follows:

Number of letters	Number of surnames
1-4	6
4-6	30
6-8	44
8-12	16
12-20	4

Draw a histogram to depict the given information.