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IX C
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CARMEL CONVENT SCHOOL (CHANDIGARH)
FIRST TERM EXAM (2023-24)
SUBJECT: MATHEMATICS

Class: - IX
Date: - 16.09.23

Maximum Marks: 80
Time Allowed: 3Hrs.

General Instructions:

1. All Questions are compulsory.
2. This Question Paper has 5 Sections A-E.
3. Section A has 20 MCQs carrying 1 mark each.
4. Section B has 5 questions carrying 2 marks each.
5. Section C has 6 questions carrying 3 marks each.
6. Section D has 4 question carrying 5 marks each.
7. Section E has 3 questions carrying 4 marks each.

SECTION-A

1. The decimal expansion of the number $\sqrt{2}$ is

   (a) A finite decimal
   (b) 1.41421
   (c) Non-terminating recurring
   (d) Non-terminating non-recurring

2. The value of $(300)^2 - (299)^2$ is

   (a) 499 (b) $(1)^2$ (c) 600 (d) 599

3. Point (0, -7) lies

   (a) on the x-axis (b) in second quadrant.
   (c) on the y-axis (d) in 4th quadrant

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

   (a) 4 (b) 14 (c) 5 (d) 2

5. One angle is equal to 3 times its supplement. The measure of the angle is

   (a) 130° (b) 135° (c) 90° (d) 120°

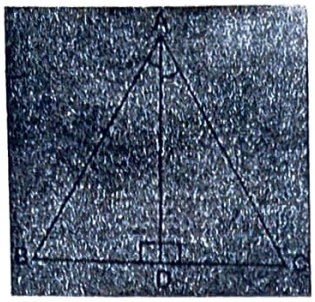
6. In triangles ABC and DEF, AB = FD and $\angle A = \angle D$. The two triangles will be congruent by SAS congruency if

   (a) BC = EF (b) AC = DE (c) AC = EF (d) BC = DE

7. The area of a right angled triangle whose base =12cm and height = 5 cm is_____.

(a) 60 cm^2 (b) 30 cm^2 (c) $15\sqrt{3}\,cm^2$ (d) 45 cm^2

8. In figure, AD is bisector of $\angle A$ and AD is perpendicular to BC. Then ΔABD and ΔACD are congruent by which criterion?



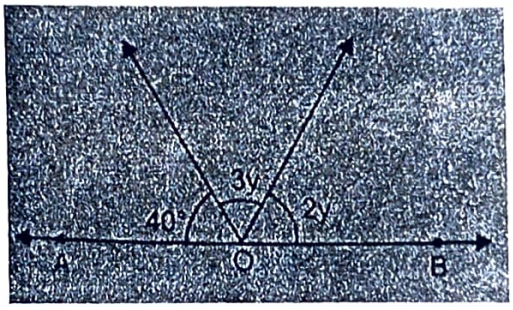
(a) ASA (b) SSS (c) SAS (d) None of these

9. The perimeter of an equilateral triangle is 60 m. The area is

(a) $10\sqrt{3}\,m^2$ (b) $15\sqrt{3}\,m^2$ (c) $20\sqrt{3}\,m^2$ (d) $100\sqrt{3}\,m^2$

10. In the given figure, the value of y is

(a) 28° (b) 32° (c) 36° (d) 44°



11. A rational number between -3 and 3 is_____.

(a) 0 (b) -4.3 (c)-3.4 (d) 1.1011001110001.....

12. The coefficient of x^2 in $(2x^2 - 5)(4 + 3x^2)$ is

(a) 7 (b) -7 (c) 2 (d) 3

13. If (x + 3, 5) = (2, 2-y) then values of x and y are

(a) x = 5, y = 3 (b) x = -1, y = -3 (c) x = 0, y = -3 (d) x = 1, y = 3

14. Equation of x-axis is

(a) x = y (b) x = 0 (c) y = 0 (d) None of these

15. If p(x) = x + 3, then p(x) + p(-x) is equal to

(a) 3 (b) 2x (c) 0 (d) 6

16. If the linear equation has solutions (-2, 2), (0, 0), (5, -5) then the equation is

(a) x-y = 0 (b) x + 2y = 0 (c) 2x - y = 0 (d) x + y = 0

17. Which of the following is a polynomial?

(a) $\sqrt{5} + x^{-4}$ (b) $\frac{7}{x}$ (c) $7\sqrt{3} + x^2$ (d) $-4\sqrt{x}$

18. **ASSERTION(A)** : The product of $(2)^{\frac{1}{3}}$ $(2)^{\frac{2}{3}}$ is equal to 2

REASON(R) : $a^m \times a^n = a^{m+n}$

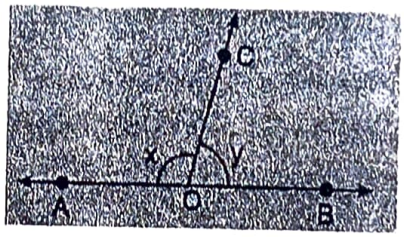
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true and R is not the correct explanation of A.
(c) A is true and R is false.
(d) A is false and R is true.

19. In ΔPQR, QR = PQ and $\angle Q = 80°$. Then $\angle P$ is equal to

(a) 80° (b) 40° (c) 50° (d) 100°

20. In figure, x is greater than y by one third of a right angle. The values of x and y are

(a) 105°, 75° (b) 100°, 80° (c) 95°, 85° (d) 110°, 70°



SECTION-B

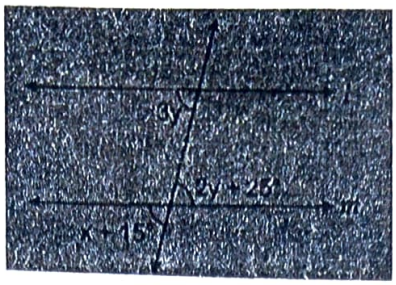
21. Simplify $\sqrt[4]{81}$

22. Given an example each of a binomial of degree 45 and of a monomial of degree 200.

23. Find the point which lies on the line y = 7x having abscissa 3.

24. If the sum of twice of ordinate of a point ~~to~~ and abscissa of the point is 7, express the statement in the form of a linear equation in two variables.

25. In figure, if l || m, then what is the value of x and y?

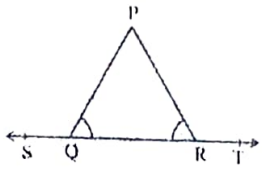


SECTION-C

26. The sides of a triangular plot are in the ratio of 3:5:7 and its perimeter is 300m. Find its area.

27. Use factor theorem to determine whether g(x) = -2+x is a factor of p(x) = $-x^2 + 2x^3 - 2x - 7$ or not.

28. If given figure, $\angle PQR = \angle PRQ$ then prove that $\angle PQS = \angle PRT$



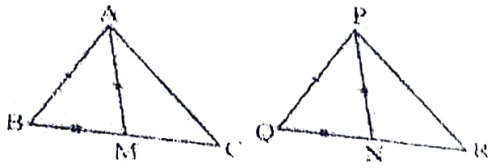
29. Show that the angles of an equilateral triangle is 60° each.

30. If a+ b + c = 9 and ab + bc + ca = 26, find $a^2 + b^2 + c^2$

31. Factorize: $a^3 - \frac{1}{a^3} - 2a + \frac{2}{a}$

SECTION-D

32. Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of ΔPQR (see figure). Show that:

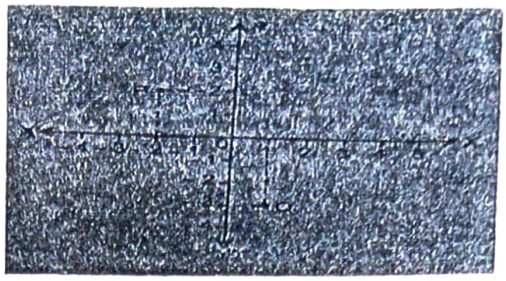


(a) $\Delta ABM \cong \Delta PQN$
(b) $\Delta ABC \cong \Delta PQR$

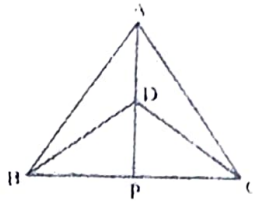
33 (i) Find the value of 'a' and 'b' if

$\frac{\sqrt{7}+1}{\sqrt{7}-1} = a + b\sqrt{7}$ (3)

(ii) From the given figure, find the co-ordinates of P and Q. (2)



34. ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC (see figure). If AD is extended to intersect BC at P show that:



(a) $\Delta ABD \cong \Delta ACD$
(b) $\Delta ABP \cong \Delta ACP$
(c) AP bisect $\angle A$ as well as $\angle D$
(d) AP is the perpendicular bisector of BC.

35. (i) Express $1.\overline{27}$ is form of $\frac{m}{n}$, where m and n are integers and n ≠ o. (2.5)

(ii) Factorise $49x^4 - 168\,x^2y^2 + 144y^4$ (2.5)

SECTION-E

36. Three friends Sumit, Manoj and Kartike started a business together. They decided to share three capital depending on the variable expenditure. If the capital of the three partners together is given by the polynomial $x^3 - 5\,x^2 + 2x + 8$, which is the product of their individual share factors?

1. The degree of a given polynomial is_____. (1)

(a) 1 (b) 2 (c) 3 (d) 4

2. The total expenditure of Sumit, Manoj and Kartike when x = 20 (in ₹) (1)

(a) ₹5000 (b) ₹6048 (c) ₹6400 (d) ₹5600

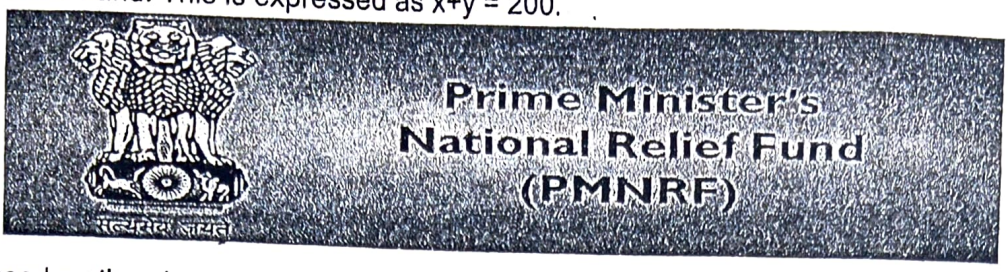
3. The shares of a Sumit, Manoj and Kartike individually is (2)

(a)(x+1) (x-2) (x-4) (b) (x-1) (x+2) (x+4)

(c) (x-1) (x+2) (x-4) (d) (x+2) (x+1) (x+4)

37. Prime Minister's National Relief Fund (also called PMINRF is short) is the fund

raised to provide support for people affected by natural and man-made disasters. Natural disasters that are covered under this include flood, cyclone, earthquake etc. Man- made disaster that are included our major accidents, acid attacks, rlots, etc. Two friend Shalu and Gitika together contributed ₹200 towards Prime Minister's Relief Fund. This is expressed as x+y = 200.



Based on the above answer the following questions:

(a) The linear equation x+y = 200 in the form ax + by + c = 0 can be written as: (1)

(i) -x+y = 200 (ii) x+y-200= 0

(iii) y= 200 (iv) x-y=200

(b) If Shalu contributed ₹150, then how much was contributed by Gitika? (1)

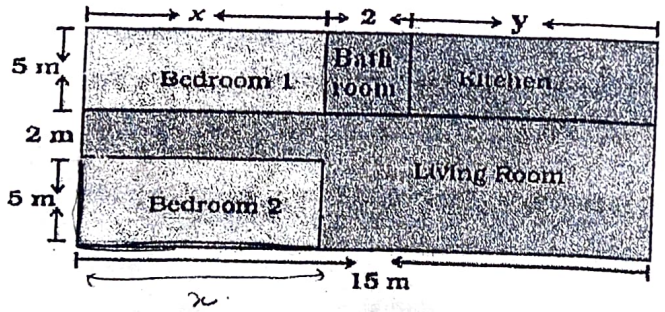
(i) ₹70. (ii) ₹ 60 (iii) ₹ 50 (iv) ₹160

(c) The solution of the equation x + y = 200 will be_____ (2)

(i) x=50, y=70 (ii) x=150, y=70

(iii) x=150, y=50 (iv) x=60, y=40

38. In the below given layout, the design and measurements has been made such that area of two bedrooms and kitchens together is 95 sq. m.



1. The area of two bedroom and kitchen are respectively equal to (1)

(a) 5x, 5y (b) 10x, 5y (c) 5x,10y (d) x, y

2. Find the length of the outer boundary of the layout. (1)

(a) 27m (b) 15m (c) 50m (d) 54m

3. By referring to the figure given above, the pair of linear equations in two variables formed from the statements are (2)

(a) x + y = 13, x + y = 9 (b) 2 x + y = 13, x + y = 9

(c) x + y = 13, 2x + y = 19 (d) None of the above

THE END