SCHOOL LEVEL EXAM (2025 – 2026)

MATHS MARATHON
Competition For Excellence

CLASS
8

Total Questions : 100 **Total Marks : 100** **Time : 80 Minutes**

INSTRUCTIONS TO THE STUDENT'S

1. Please do not open this question paper unless you are instructed.
2. **Don't write anything on question paper, you can carry blank page for rough calculations**
3. Additional 5 minutes will be given to the candidates for filling up the student's details before the start of the competition.
4. The paper consists of 5 different chapters of the textbook.
5. All questions are compulsory and consist of equal marks.
6. Each question is carrying 1 mark; there is no negative marking.
7. There is only one correct answer, hence mark one answer only.
8. **Darken the circle with dark pencil or blue/black ball pen only.**
9. **Return the answer sheet along with the question paper** to the supervisor at the end of the exam.

Name - _____

SCHOOL - _____

ROLL NO - _____ CLASS - _____

SECTION 1 - RATIONAL AND IRRATIONAL NUMBERS

1. Which of the following is correct for rational numbers?
   A) The smaller the denominator, the smaller the value
   B) The greater the denominator, the greater the value
   C) The greater the numerator, the greater the value

2. What is the comparison between 2/5 and 4/9?
   A) 2/5 < 4/9 B) 2/5 > 4/9 C) 2/5 = 4/9

3. Which of the following rational numbers is greater: -7/8 or -5/6?
   A) -7/8 B) -5/6 C) Both are equal

4. If two rational numbers have the same numerator, how can you compare them?
   A) By comparing their numerators
   B) By comparing their denominators
   C) Both are equal

5. Which of the following rational numbers is greater: -4/5 or -5/6?
   A) -4/5 B) -5/6 C) Both are equal

6. If the denominators are the same, which rational number is greater: 3/4 or 5/4?
   A) 3/4 B) 5/4 C) Both are equal

7. What is the comparison between -3/4 and -5/8?
   A) -3/4 > -5/8 B) -3/4 = -5/8 C) -3/4 < -5/8

8. Which is greater: -5/8 or -2/7?
   A) -5/8 B) -2/7 C) Both are equal

9. Which of these is an irrational number?
   A) $\sqrt{11}$ B) 4/9 C) 0.75

10. Is $\sqrt{4}$ a rational number?
    A) Yes B) No C) Sometimes

11. What is the decimal equivalent of the rational number 3/8?
    A) 0.25 B) 0.375 C) 0.5

12. What is the decimal representation of the rational number 5/9?
    A) 0.555... B) 0.6 C) 0.625

13. Which of the following decimals represents the rational number -4/9?
    A) 0.25 B) -0.5 C) -0.444...

14. What is the decimal equivalent of the rational number 2/7?

A) 0.222... B) 0.3 C) 0.2857...

15. What is the decimal representation of the rational number 3/5?

A) 0.6 B) 0.625 C) 0.666...

16. Which of the following numbers is irrational?

A) $\sqrt{2}$ B) 0.5 C) $\sqrt{36}$

17. What type of number is $\sqrt{5}$?

A) Rational B) Irrational C) Whole

18. What is an example of an irrational number?

A) 5/8 B) 0.4 C) $\sqrt{6}$

19. Identify the irrational number.

A) $\sqrt{25}$ B) $\sqrt{2}$ C) 0.75

20.Which of these numbers is rational?

A) 0.333… B) $\sqrt{7}$ C) π

SECTION 2 - INDICES AND CUBE ROOT

21. What is the index notation for the square root of 49?

A) 7^2 B) $\sqrt{49}$ C) $49^{(1/2)}$

22. Rewrite $\sqrt[3]{169}$ using index notation.

A) $13^{(1/3)}$ B) $169^{(1/3)}$ C) $\sqrt[3]{169}$

23. Express $\sqrt{49}$ in index notation.

A) 7^2 B) $\sqrt{1/7}$ C) $49^{(1/2)}$

24. Express $\sqrt[3]{100}$ using index notation.

A) $\sqrt{3/10}$ B) 10^3 C) $100^{(1/3)}$

25. What is the cube root of 361 expressed in index notation?

A) $361^{(1/3)}$ B) 19^3 C) $\sqrt{1/19}$

26. Express $\sqrt{576}$ in index notation.

A) 24^2 B) $\sqrt{1/24}$ C) $576^{(1/2)}$

27. Rewrite $8^{5/2}$ using square root notation.

A) $\sqrt[3]{8^5}$ B) $\sqrt[5]{8}$ C) $\sqrt[2]{8^5}$

28. Convert $49^{6/2}$ to square root notation.

A) $\sqrt[2]{49^6}$ B) $\sqrt[3]{49^6}$ C) $\sqrt[6]{49}$

29. Convert $144^{11/3}$ to square root notation.

A) $\sqrt[3]{144^{11}}$ B) $\sqrt[2]{144^{11}}$ C) $\sqrt[11]{144}$

30. Express $289^{16/7}$ in terms of square root.

A) $\sqrt[3]{289^{16}}$ B) $\sqrt[16]{289^7}$ C) $\sqrt[7]{289^{16}}$

31. Express the 6th root of 64 in index form.

A) $\sqrt{6^{64}}$ B) $64^{1/6}$ C) $\sqrt[6]{64}$

32. Express the 12th root of 4096 in index form.

A) $4096^{1/12}$ B) $\sqrt[3]{4096^{12}}$ C) $\sqrt[4096]{12}$

33. Express the 4th root of 81 in index form.

A) $\sqrt[4]{81}$ B) $\sqrt[81]{4}$ C) $81^{1/4}$

34. Express the 8th root of 512 in index form.

A) $\sqrt[8]{512}$ B) $512^{1/8}$ C) $\sqrt[512]{8}$

35. Simplify $(2^{-1})^3$ as a power.

A) 2^3 B) 2^{-3} C) 2^{-1}

36. What is the cube of 4?

A) 4^2 B) $4^{1/3}$ C) 4^3

37. Express $\sqrt[3]{216}$ as a power.

A) $216^{1/3}$ B) 6 C) 216^3

38. Simplify $(2^3)^2$ as a power.

A) 2^5 B) 2^6 C) 2^9

39. Express $\sqrt[3]{729}$ as a power.

A) 729 B) $729^{1/3}$ C) 9

40. What is the cube of 11?

A) $11^{1/3}$ B) 11^2 C) 11^3

SECTION 3 - EXPANSION FORMULAE

41. Expand $(3y + 4)^2$.

A) $9y^2 + 16$ B) $9y^2 + 12y + 16$ C) $9y^2 + 24y + 16$

42. Expand $(2a - 3)(a + 5)$.

A) $2a^2 - 3a + 10$ B) $2a^2 + 7a - 15$ C) $2a^2 - 3a - 15$

43. What is the expansion of $(3x - 2)^2$?

A) $9x^2 - 12x + 4$ B) $9x^2 – 6$ C) $9x^2 - 4$

44. Expand $(x - 3)(x + 4)$.

A) $x^2 - x - 12$ B) $x^2 + x - 12$ C) $x^2 + x - 7$

45. Expand $(3x - 2)^3$.

A) $27x^3 - 54x^2 - 36x - 8$ B) $27x^3 - 54x^2 - 12x + 8$ C) $27x^3 - 54x^2 + 36x - 8$

46. What is the expansion of $(2y - 1)^3$?

A) $8y^3 - 12y^2 + 6y - 1$ B) $8y^3 - 12y^2 - 6y + 1$ C) $8y^3 - 12y^2 - 6y - 1$

47. What is the expansion of $(x + 1)^3$?

A) $x^3 + 3x^2 + 3x + 1$ B) $x^3 + 3x^2 + 3x - 1$ C) $x^3 + 3x^2 - 3x + 1$

48. Expand $(2a + 4)^3$.

A) $8a^3 + 48a^2 + 96a - 64$ B) $8a^3 + 48a^2 - 96a + 64$ C) $8a^3 + 48a^2 + 96a + 64$

49. What is the expansion of $(a + b - c)^2$?

A) $a^2 + 2ab - 2ac + b^2 - 2bc + c^2$

B) $a^2 + 2ab - 2ac + b^2 - 2bc - c^2$

C) $a^2 + 2ab - 2ac + b^2 + 2bc - c^2$

50. What is the expansion of $(x + y - z)^2$?

A) $x^2 + 2xy - 2xz + y^2 - 2yz - z^2$

B) $x^2 + 2xy - 2xz + y^2 - 2yz + z^2$

C) $x^2 + 2xy - 2xz + y^2 + 2yz - z^2$

51. What is the expansion of $(\frac{2}{3}a + \frac{1}{4}b)^2$?

A) $\frac{4}{9}a^2 + \frac{1}{3}ab + \frac{1}{16}b^2$ B) $\frac{4}{9}a^2 + \frac{1}{8}ab + \frac{1}{4}b^2$ C) $\frac{4}{9}a^2 + \frac{1}{3}ab + \frac{1}{4}b^2$

52. Expand $(\frac{2}{3}a + \frac{3}{4}b)^2$.

A) $\frac{4}{9}a^2 - ab + \frac{9}{16}b^2$ B) $\frac{4}{9}a^2 - \frac{1}{2}ab + \frac{9}{16}b^2$ C) $\frac{4}{9}a^2 + ab + \frac{9}{16}b^2$

53. What is the expansion of $(\frac{3}{4}y + \frac{2}{5})^2$?

A) $\frac{9}{16}y^2 + \frac{3}{5}y + \frac{4}{25}$ B) $\frac{9}{16}y^2 + \frac{3}{10}y + \frac{4}{25}$ C) $\frac{9}{16}y^2 + \frac{6}{5}y + \frac{4}{25}$

54. What is the expansion of $(\frac{2}{3}x + \frac{1}{4}y)^2$?

A) $\frac{4}{9}x^2 + \frac{1}{6}xy + \frac{1}{16}y^2$ B) $\frac{4}{9}x^2 + \frac{1}{3}xy + \frac{1}{16}y^2$ C) $\frac{4}{9}x^2 + \frac{1}{6}xy - \frac{1}{8}y^2$

55. What is the expansion of $(\frac{5}{6}x - \frac{1}{3})^3$?

A) $\frac{125}{216}x^3 - \frac{25}{36}x^2 + \frac{5}{18}x - \frac{1}{27}$

B) $\frac{125}{216}x^3 - \frac{25}{36}x^2 + \frac{5}{18}x - \frac{1}{54}$

C) $\frac{125}{216}x^3 - \frac{25}{54}x^2 + \frac{5}{18}x - \frac{1}{108}$

56. What is the expansion of $(\frac{2}{3}x + \frac{1}{4}y)^3$?

A) $\frac{8}{27}x^3 + \frac{1}{9}x^2y + \frac{1}{24}xy^2 + \frac{1}{32}y^3$

B) $\frac{8}{27}x^3 + \frac{1}{3}x^2y + \frac{1}{8}xy^2 + \frac{1}{64}y^3$

C) $\frac{8}{27}x^3 + \frac{1}{9}x^2y + \frac{1}{24}xy^2 + \frac{1}{64}y^3$

57. Expand $(\frac{2}{3}a - \frac{1}{4}b)^3$.

A) $\frac{8}{27}a^3 - \frac{1}{6}a^2b + \frac{1}{12}ab^2 - \frac{1}{64}b^3$

B) $\frac{8}{27}a^3 - \frac{1}{3}a^2b + \frac{1}{8}ab^2 - \frac{1}{64}b^3$

C) $\frac{8}{27}a^3 - \frac{1}{6}a^2b + \frac{1}{12}ab^2 - \frac{1}{32}b^3$

58. What is the expansion of $(x - 3)(x - 2)$?

A) $x^2 - 5x - 6$ B) $x^2 + 5x + 6$ C) $x^2 - 5x + 6$

59. Expand $(\frac{2}{3}x + \frac{1}{4}y - \frac{1}{5}z)^2$.

A) $\frac{4}{9}x^2 + \frac{1}{16}y^2 + \frac{1}{25}z^2 + \frac{1}{6}xy - \frac{1}{40}yz + \frac{4}{30}xz$

B) $\frac{4}{9}x^2 + \frac{1}{16}y^2 + \frac{1}{25}z^2 + \frac{1}{6}xy - \frac{1}{40}yz - \frac{4}{30}xz$

C) $\frac{4}{9}x^2 + \frac{1}{16}y^2 + \frac{1}{25}z^2 + \frac{1}{6}xy + \frac{1}{40}yz - \frac{4}{30}xz$

60. What is the expansion of $(\frac{3}{4}a - \frac{1}{5}b + \frac{1}{6}c)^2$?

A) $\frac{9}{16}a^2 - \frac{3}{10}ab + \frac{1}{25}b^2 + 4ac - \frac{1}{15}bc - \frac{1}{36}c^2$

B) $\frac{9}{16}a^2 - \frac{3}{10}ab + \frac{1}{25}b^2 + \frac{1}{4}ac - \frac{1}{15}bc + \frac{1}{36}c^2$

C) $\frac{9}{16}a^2 - \frac{3}{10}ab + \frac{1}{25}b^2 + \frac{1}{9}ac - \frac{1}{13}bc + \frac{1}{36}c^2$

SECTION 4 - FACTORIZATION OF ALGEBRAIC EXPRESSIONS

61. Which property allows us to factorize quadratic trinomials?

A) Distributive property B) Commutative property C) Zero product property

62. What is the factorization of $x^2 + 6x + 9$?

A) $(x + 9)\,(x + 1)$ B) $(x + 3)\,(x - 3)$ C) $(x + 3)^2$

63. What is the factorization of $4x^2 - 12x + 9$?

A) $(2x - 3)^2$ B) $(2x - 3)\ (2x - 3)$ C) $(2x + 3)^2$

64. Which property is utilized in factorizing quadratic trinomials by grouping?

A) Associative property B) Distributive property C) Commutative property

65. The expression $9a^2 - 25b^2$ can be factored as ?

A) $(3a + 5b)\ (3a - 5b)$ B) $(3a - 5b)\ (3a - 5b)$ C) $(3a + 5b)\ (3a + 5b)$

66. Determine the factors of $8x^2 - 12x - 5$.

A) $(4x - 1)\ (2x + 5)$ B) $(4x + 1)\ (2x - 5)$ C) $(4x - 1)\ (2x - 5)$

67. Determine the factors of $4x^2 - 12x + 9$.

A) $(2x - 3)^2$ B) $(2x - 3)\ (2x + 3)$ C) $(2x + 3)^2$

68. Find the factors of $25a^2 - 64$.

A) $(5a + 8)\ (5a + 8)$ B) $(5a - 8)\ (5a - 8)$ C) $(5a - 8)\ (5a + 8)$

69. What method is commonly used to factorize cubic binomials like $a^3 + b^3$?

A) Completing the square B) Sum of cubes C) Difference of squares

70. Which method can be used to verify the factorization of $a^3 + b^3$?

A) Multiplying the factors B) Dividing the original expression by the factors

C) Adding the factors

71. What are the factors of $x^2 - 16x + 64$

A) $(x + 8)(x - 8)$ B) $(x - 8)^2$ C) $(x + 8)^2$

72. What is the factorization of $125a^3 + 64b^3$?

A) $(5a + 4b)^3$ B) $(5a - 4b)^3$ C) (5a+4b)($25a^2 - 20ab + 16b^2$)

73. Which expression is equivalent to $a^3 - b^3$ after factorization?

A) $(a + b)^2$ B) None of the above C) $(a - b)^2$

74. What is the factorization of $a^3 - 27b^3$?

A) $(a - 3b)^2$ B) $(a + 3b)^2$ C) $(a - 3b)\ (a^2 + 3ab + 9b^2)$

75. What is the factorization of $64x^3 - 1$?

A) $(4x - 1)^3$ B) $(4x + 1)^3$ C) $(4x - 1)\ (16^2 + 4x + 1)$

76. Which expression is equivalent to $m^3 - 8n^3$?

A) $(5m - 2n)^3$ B) $(m - 2n)\ (m^2 + 2mn + 4n^2)$ C) $(5m + 2n)^3$

77. Which of the following is equivalent to the rational expression $\frac{x^2-4}{x^2-2x+1}$?

A) $\frac{(x+2)\ (x-2)}{(x-1)^2}$ B) $\frac{(x-2)\ (x-2)}{(x-1)^2}$ C) $\frac{(x+2)\ (x+2)}{(x-1)^2}$

78 Which of the following expressions is equivalent to the rational expression $\frac{x^2-9}{x^2-4}$?

A) $\frac{(x-3)\,(x+3)}{(x-2)\,(x-2)}$ B) $\frac{(x-3)\,(x+3)}{(x+2)\,(x-2)}$ C) $\frac{(x-3)\,(x-3)}{(x-2)\,(x-2)}$

79. Simplify $\frac{8x^3-27y^3}{4x^2-9y^2}$?

A) $\frac{4x^2+6xy-9y^2}{2x+3y}$ B) $\frac{4x^2+6xy+9y^2}{2x-3y}$ C) $\frac{4x^2+6xy+9y^2}{2x+3y}$

80. Simplify $\frac{x^2-5x-24}{(x+3)(x+8)}$ x $\frac{x^2-64}{(x-8)^2}$?

A) $(x-8)$ B) 1 C) $(x+8)$

SECTION 5 - VARIATION / DISCOUNT AND COMMISSION

81. If y varies directly as x, and y = 10 when x = 5, what is the value of y when x = 8?

A) 16 B) 25 C) 12

82. If y varies directly as x, and y = 25 when x = 5, what is the value of y when x = 10?

A) 40 B) 50 C) 30

83. The cost of printing flyers is directly proportional to the number of flyers printed. If 500 flyers cost $50, how much would 1200 flyers cost?

A) $120 B) $288 C) $60

84. A garden hose fills a pool at a rate of 15 liters per minute. How many minutes will it take to fill a pool with a capacity of 600 liters?

A) 25 minutes B) 30 minutes C) 40 minutes

85. The amount of paint needed to paint a wall is directly proportional to the area of the wall. If 2 liters of paint are needed for a wall with an area of 20 square meters, how much paint will be needed for a wall with an area of 30 square meters?

A) 3 liters B) 4.5 liters C) 6 liters

86. The strength of a magnet is directly proportional to its length. If magnet with a length of 10 cm has a strength of 50 units, what is the strength of a magnet with a length of 15 cm?

A) 125 units B) 100 units C) 75 units

87. The equation y = $\frac{k}{x}$ represents:

A) Direct variation B) Inverse variation C) No variation

88. If y varies inversely as x, and y = 20 when x = 4, what is the value of x when y = 16?

A) 3 B) 8 C) 5

89. The number of workers needed to complete a construction project is inversely proportional to the time it takes to complete the project. If 6 workers can complete the project in 10 days, how many days will it take for 12 workers to complete the same project?

A) 20 days B) 5 days C) 15 days

90. The force of attraction between two electric charges is inversely proportional to the square of the distance between them. If the force between two charges is 9 N when they are 3 meters apart, what will be the force when they are 6 meters apart?

A) 1.5 N B) 0.25 N C) 2.25 N

91. If 8 workers can complete a task in 12 days, how many days will 6 workers take to complete the same task?

A) 16 days B) 14 days C) 20 days

92. If a tap can fill a tank in 8 hours, how long will it take to fill the tank if two taps of the same capacity are opened simultaneously?

A) 8 hours B) 4 hours C) 12 hours

93. If a cyclist travels 80 kilometers at an average speed of 20 km/h, how long does the journey take?

A) 2 hours B) 3 hours C) 4 hours

94. A toy store gives a discount of 10% on all toys. If a toy costs $50 before the discount, how much will it cost after the discount?

A) $45 B) $55 C) $40

95. A watch originally priced at $150 is sold with a discount of 20%. What is the discounted price of the watch?

A) $140 B) $130 C) $120

96. A store is offering a discount of 30% on all shoes. If a pair of shoes originally costs $80, what is its price after the discount?

A) $72 B) $64 C) $56

97. If a travel agent earns a commission of 8% on a tour package sold for $1500, how much commission does the agent earn?

A) $120 B) $150 C) $180

98. If a real estate agent earns a commission of 6% on a property sold for $300,000, how much commission does the agent earn?

A) $16000 B) $14000 C) $18000

99. A salesperson earns a commission of 6% on all sales. If the total sales amount to $15,000, what is the commission earned by the salesperson?

A) $1,000 B) $900 C) $1,500

100. A shop offers a rebate of 25% on a product priced at $120. What is the amount of rebate?

A) $20 B) $25 C) $30

ANSWER

Q.No	ANS	Q.No	ANS	Q.No	ANS	Q.No	ANS	Q.No	ANS
1	C	21	C	41	C	61	A	81	A
2	A	22	B	42	B	62	C	82	B
3	B	23	C	43	A	63	A	83	A
4	B	24	C	44	B	64	B	84	C
5	A	25	A	45	C	65	A	85	A
6	B	26	C	46	A	66	B	86	C
7	C	27	C	47	A	67	A	87	B
8	B	28	A	48	C	68	C	88	C
9	A	29	A	49	A	69	B	89	B
10	A	30	C	50	B	70	A	90	C
11	B	31	B	51	A	71	B	91	A
12	A	32	A	52	C	72	C	92	B
13	C	33	C	53	A	73	B	93	C
14	C	34	B	54	B	74	C	94	A
15	A	35	B	55	A	75	C	95	C
16	A	36	C	56	B	76	B	96	C
17	B	37	A	57	B	77	A	97	A
18	C	38	B	58	C	78	B	98	C
19	B	39	B	59	B	79	C	99	B
20	A	40	C	60	B	80	A	100	C