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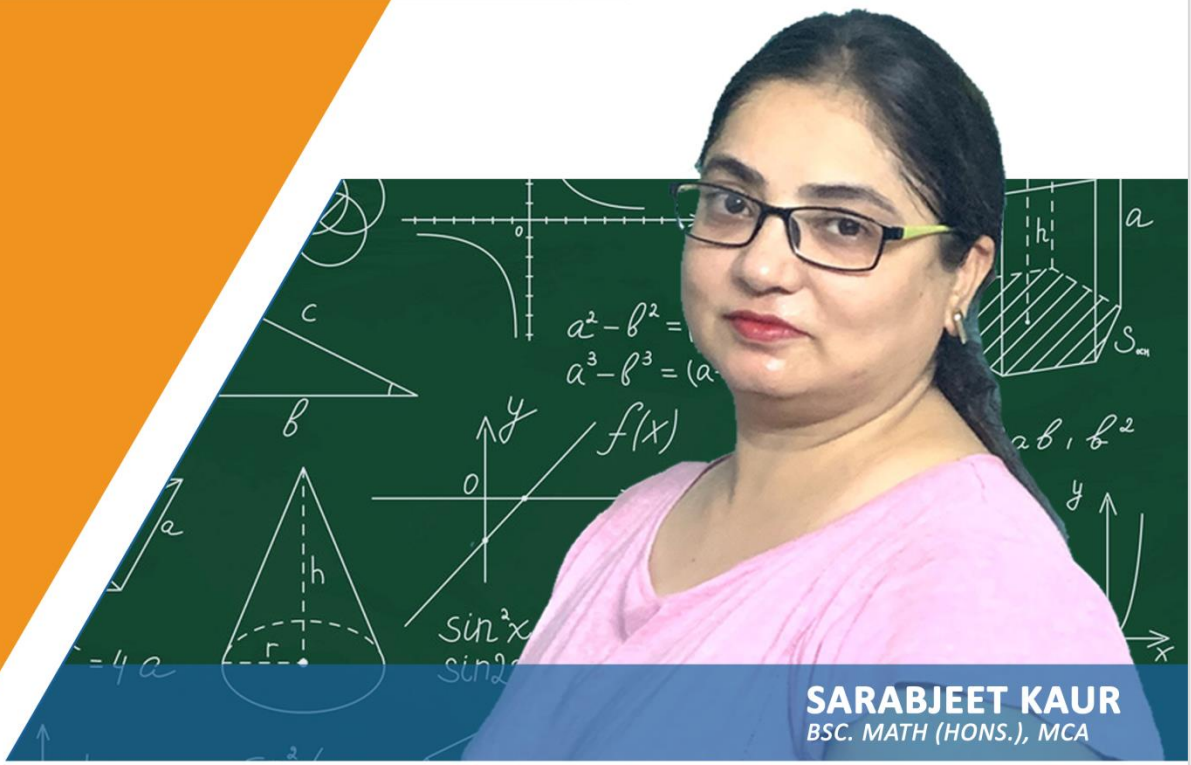

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GRADE 9TH MATHS

CHAPTER 1

REAL NUMBERS

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MULTIPLE-CHOICE QUESTIONS (MCQ)

Choose the correct answer in each of the following questions.

1. Which of the following is a rational number? [2010]

(a) $1+\sqrt{3}$ (b) π (c) $2\sqrt{3}$ (d) 0

2. A rational number between –3 and 3 is [2010]

(a) 0 (b) −4.3

(c) –3.4 (d) 1.101100110001 …

3. Two rational numbers between $\frac{2}{3}$ and $\frac{5}{3}$ are [2010]

(a) $\frac{1}{6}$ and $\frac{2}{6}$ (b) $\frac{1}{2}$ and $\frac{2}{1}$ (c) $\frac{5}{6}$ and $\frac{7}{6}$ (d) $\frac{2}{3}$ and $\frac{4}{3}$

4. Every point on a number line represents [2010]

(a) a rational number (b) a natural number

(c) an irrational number (d) a unique number

5. Which of the following is a rational number?

(a) $\sqrt{2}$ (b) $\sqrt{23}$

(c) $\sqrt{225}$ (d) 0.1010010001…

6. Every rational number is

(a) a natural number (b) a whole number

(c) an integer (d) a real number

7. Between any two rational numbers there

(a) is no rational number

(b) is exactly one rational number

(c) are infinitely many rational numbers

(d) is no irrational number

8. The decimal representation of a rational number is

(a) always terminating

(b) either terminating or repeating

(c) either terminating or nonrepeating

(d) neither terminating nor repeating

9. The decimal representation of an irrational number is
(a) always terminating
(b) either terminating or repeating
(c) either terminating or nonrepeating
(d) neither terminating nor repeating

10. The decimal expansion that a rational number cannot have is
(a) 0.25 (b) $0.25\overline{28}$
(c) $0.\overline{2528}$ (d) 0.5030030003…

11. Which of the following is an irrational number? [2011]
(b) 3.14 (b) 3.141414 …
(c) 3.14444 … (d) 3.141141114 …

12. A rational number equivalent to $\frac{7}{19}$ is [2011]
(a) $\frac{17}{119}$ (b) $\frac{14}{57}$ (c) $\frac{21}{38}$ (d) $\frac{21}{57}$

13. Choose the rational number which does not lie between $-\frac{2}{3}$ and $-\frac{1}{5}$. [2011]
(a) $-\frac{3}{10}$ (b) $\frac{3}{10}$ (c) $-\frac{1}{4}$ (d) $-\frac{7}{20}$

14. π is (2010, '11)
(a) a rational number (b) an integer
(c) an irrational number (d) a whole number

15. The decimal expansion of $\sqrt{2}$ is
(a) finite decimal (b) 1.4121
(c) nonterminating recurring (d) nonterminating, nonrecurring

16. Which of the following is an irrational number?
(a) $\sqrt{23}$ (b) $\sqrt{225}$
(c) 0.3799 (d) $7.\overline{478}$

17. How many digits are there in the repeating block of digits in the decimal expansion of $\frac{17}{7}$?
(a) 16 (b) 6 (c) 26 (d) 7

18. Which of the following numbers is irrational?
(a) $\sqrt{\frac{4}{9}}$ (b) $\frac{\sqrt{1250}}{\sqrt{8}}$ (c) $\sqrt{8}$ (d) $\frac{\sqrt{24}}{\sqrt{6}}$

19. The product of two irrational numbers is

(a) always irrational

(b) always rational

(c) always an integer

(d) sometimes rational and sometimes irrational

20. Which of the following is a true statement?

(a) The sum of two irrational numbers is an irrational number.

(b) The product of two irrational numbers is an irrational number.

(c) Every real number is always rational.

(d) Every real number is either rational or irrational.

21. Which of the following is a true statement?

(a) π and $\frac{22}{7}$ are both rationals.

(b) π and $\frac{22}{7}$ are both irrationals.

(c) π is rational and $\frac{22}{7}$ is irrational.

(d) π is irrational and $\frac{22}{7}$ is rational.

22. A rational number lying between $\sqrt{2}$ and $\sqrt{3}$ is [2010]

(a) $\frac{(\sqrt{2}+\sqrt{3})}{2}$ (b) $\sqrt{6}$ (c) 1.6 (d) 1.9

23. Which of the following is a rational number? [2010]

(a) $\sqrt{5}$ (b) 0.101001000100001…

(c) π (d) 0.853853853…

24. The product of a nonzero rational number with an irrational number is always a/an

(a) irrational number (b) rational number

(c) whole number (d) natural number

25. The value of $0.\overline{2}$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$, is [2011]

(a) $\frac{1}{5}$ (b) $\frac{2}{9}$ (c) $\frac{2}{5}$ (d) $\frac{1}{8}$

26. The simplest form of $1.\overline{6}$ is

(a) $\frac{833}{500}$ (b) $\frac{8}{5}$ (c) $\frac{5}{3}$ (d) none of these

27. The simplest form of $0.\overline{54}$ is

(a) $\frac{27}{50}$ (b) $\frac{6}{11}$ (c) $\frac{4}{7}$ (d) none of these

28. The simplest form of $0.3\overline{2}$ is

(a) $\frac{16}{45}$ (b) $\frac{32}{99}$ (c) $\frac{29}{90}$ (d) none of these

29. The simplest form of $0.12\overline{3}$ is

(a) $\frac{41}{330}$ (b) $\frac{37}{330}$ (c) $\frac{41}{333}$ (d) none of these

30. An irrational number between 5 and 6 is

(a) $\frac{1}{2}(5+6)$ (b) $\sqrt{5+6}$ (c) $\sqrt{5\times 6}$ (d) none of these

31. An irrational number between $\sqrt{2}$ and $\sqrt{3}$ is

(a) $(\sqrt{2}+\sqrt{3})$ (b) $\sqrt{2}\times\sqrt{3}$ (c) $5^{1/4}$ (d) $6^{1/4}$

32. An irrational number between $\frac{1}{7}$ and $\frac{2}{7}$ is

(a) $\frac{1}{2}\left(\frac{1}{7}+\frac{2}{7}\right)$ (b) $\left(\frac{1}{7}\times\frac{2}{7}\right)$ (c) $\sqrt{\frac{1}{7}\times\frac{2}{7}}$ (d) none of these

33. The sum of $0.\overline{3}$ and $0.\overline{4}$ is [2010]

(a) $\frac{7}{10}$ (b) $\frac{7}{9}$ (c) $\frac{7}{11}$ (d) $\frac{7}{99}$

34. The value of $2.\overline{45}+0.\overline{36}$ is

(a) $\frac{67}{33}$ (b) $\frac{24}{11}$ (c) $\frac{31}{11}$ (d) $\frac{167}{110}$

35. Which of the following is the value of $(\sqrt{11}-\sqrt{7})(\sqrt{11}+\sqrt{7})$? [2010]

(a) -4 (b) 4 (c) $\sqrt{11}$ (d) $\sqrt{7}$

36. $(-2-\sqrt{3})(-2+\sqrt{3})$ when simplified is

(a) positive and irrational (b) positive and rational
(c) negative and irrational (d) negative and rational

37. $(6+\sqrt{27})-(3+\sqrt{3})+(1-2\sqrt{3})$ when simplified is

(a) positive and irrational (b) positive and rational
(c) negative and irrational (d) negative and rational

38. When $15\sqrt{15}$ is divided by $3\sqrt{3}$, the quotient is

(a) $5\sqrt{3}$ (b) $3\sqrt{5}$ (c) $5\sqrt{5}$ (d) $3\sqrt{3}$

39. The value of $\sqrt{20}\times\sqrt{5}$ is [2010]

(a) 10 (b) $2\sqrt{5}$ (c) $20\sqrt{5}$ (d) $4\sqrt{5}$

40. The value of $\frac{4\sqrt{12}}{12\sqrt{27}}$ is

(a) $\frac{1}{9}$ (b) $\frac{2}{9}$ (c) $\frac{4}{9}$ (d) $\frac{8}{9}$

41. $\sqrt{10} \times \sqrt{15} = ?$

(a) $\sqrt{25}$ (b) $5\sqrt{6}$ (c) $6\sqrt{5}$ (d) None of these

42. $\dfrac{\sqrt{32}+\sqrt{48}}{\sqrt{8}+\sqrt{12}} = ?$

(a) $\sqrt{2}$ (b) 2 (c) 4 (d) 8

43. $(125)^{-1/3} = ?$

(a) 5 (b) -5 (c) $\frac{1}{5}$ (d) $-\frac{1}{5}$

44. The value of $7^{\frac{1}{2}} \cdot 8^{\frac{1}{2}}$ is [2010]

(a) $(28)^{1/2}$ (b) $(56)^{1/2}$ (c) $(14)^{1/2}$ (d) $(42)^{1/2}$

45. After simplification, $\dfrac{13^{1/5}}{13^{1/3}}$ is

(a) $13^{2/15}$ (b) $13^{8/15}$ (c) $13^{1/3}$ (d) $13^{-2/15}$

46. The value of $\sqrt[4]{(64)^{-2}}$ is

(a) $\frac{1}{8}$ (b) $\frac{1}{2}$ (c) 8 (d) $\frac{1}{64}$

47. The value of $\dfrac{2^0+7^0}{5^0}$ is [2011]

(a) 0 (b) 2 (c) $\frac{9}{5}$ (d) $\frac{1}{5}$

48. The value of $(243)^{1/5}$ is [2014]

(a) 3 (b) -3 (c) 5 (d) $\frac{1}{3}$

49. $9^3 + (-3)^3 - 6^3 = ?$

(a) 432 (b) 270 (c) 486 (d) 540

50. Simplified value of $(16)^{-\frac{1}{4}} \times \sqrt[4]{16}$ is [2010]

(a) 0 (b) 1 (c) 4 (d) 16

51. The value of $\sqrt[4]{\sqrt[3]{2^2}}$ is

(a) $2^{-1/6}$ (b) 2^{-6} (c) $2^{1/6}$ (d) 2^6

52. Simplified value of $(25)^{1/3} \times 5^{1/3}$ is

(a) 25 (b) 3 (c) 1 (d) 5

53. The value of $\left[(81)^{\frac{1}{2}}\right]^{\frac{1}{2}}$ is

(a) 3 (b) -3 (c) 9 (d) $\frac{1}{3}$

54. There is a number x such that x^2 is irrational but x^4 is rational. Then, x can be

(a) $\sqrt{5}$ (b) $\sqrt{2}$ (c) $\sqrt[3]{2}$ (d) $\sqrt[4]{2}$

55. If $x = \frac{\sqrt{7}}{5}$ and $\frac{5}{x} = p\sqrt{7}$ then the value of p is

(a) $\frac{7}{25}$ (b) $\frac{25}{7}$ (c) $\frac{7}{15}$ (d) $\frac{15}{7}$

56. The value of $\left(\frac{256x^{16}}{81y^4}\right)^{-\frac{1}{4}}$ is

(a) $\frac{3y}{8x^4}$ (b) $\frac{3y}{4x^4}$ (c) $\frac{4y}{5x^4}$ (d) $\frac{4x^4}{3y}$

57. The value of $x^{p-q} \cdot x^{q-r} \cdot x^{r-p}$ is equal to

(a) 0 (b) 1 (c) x (d) x^{pqr}

58. The value of $\sqrt{p^{-1}q} \cdot \sqrt{q^{-1}r} \cdot \sqrt{r^{-1}p}$ is

(a) -1 (b) 0 (c) 1 (d) 2

59. $\sqrt[3]{2} \times \sqrt[4]{2} \times \sqrt[12]{32} = ?$

(a) 2 (b) $\sqrt{2}$ (c) $2\sqrt{2}$ (d) $4\sqrt{2}$

60. If $\left(\frac{2}{3}\right)^x \left(\frac{3}{2}\right)^{2x} = \frac{81}{16}$ then $x = ?$

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

61. If $(3^3)^2 = 9^x$ then $5^x = ?$

(a) 1 (b) 5 (c) 25 (d) 125

62. On simplification, the expression $\frac{5^{n+2} - 6 \times 5^{n+1}}{13 \times 5^n - 2 \times 5^{n+1}}$ equals

(a) $\frac{5}{3}$ (b) $-\frac{5}{3}$ (c) $\frac{3}{5}$ (d) $-\frac{3}{5}$

63. The simplest rationalisation factor of $\sqrt[3]{500}$ is

(a) $\sqrt{5}$ (b) $\sqrt{3}$ (c) $\sqrt[3]{5}$ (d) $\sqrt[3]{2}$

64. The simplest rationalisation factor of $(2\sqrt{2} - \sqrt{3})$ is

(a) $2\sqrt{2} + 3$ (b) $2\sqrt{2} + \sqrt{3}$ (c) $\sqrt{2} + \sqrt{3}$ (d) $\sqrt{2} - \sqrt{3}$

65. The rationalisation factor of $\frac{1}{2\sqrt{3} - \sqrt{5}}$ is [2011]

(a) $\sqrt{5} - 2\sqrt{3}$ (b) $\sqrt{3} + 2\sqrt{5}$ (c) $(\sqrt{3} + \sqrt{5})$ (d) $\sqrt{12} + \sqrt{5}$

66. Rationalisation of the denominator of $\frac{1}{\sqrt{5} + \sqrt{2}}$ gives

(a) $\frac{1}{\sqrt{10}}$ (b) $\sqrt{5} + \sqrt{2}$ (c) $\sqrt{5} - \sqrt{2}$ (d) $\frac{\sqrt{5} - \sqrt{2}}{3}$

67. If $x = 2 + \sqrt{3}$ then $\left(x + \frac{1}{x}\right)$ equals

(a) $-2\sqrt{3}$ (b) 2 (c) 4 (d) $4 - 2\sqrt{3}$

68. $\frac{1}{(3+2\sqrt{2})} = ?$

(a) $\frac{3-2\sqrt{2}}{17}$ (b) $\frac{(3-2\sqrt{2})}{13}$ (c) $(3-2\sqrt{2})$ (d) None of these

69. If $x = (7+4\sqrt{3})$ then $\left(x+\frac{1}{x}\right) = ?$

(a) $8\sqrt{3}$ (b) 14 (c) 49 (d) 48

70. If $\sqrt{2} = 1.41$ then $\frac{1}{\sqrt{2}} = ?$

(a) 0.075 (b) 0.75 (c) 0.705 (d) 7.05

71. If $\sqrt{7} = 2.646$ then $\frac{1}{\sqrt{7}} = ?$

(a) 0.375 (b) 0.378 (c) 0.441 (d) None of these

72. The value of $\sqrt{3-2\sqrt{2}}$ is

(a) $\sqrt{3}+\sqrt{2}$ (b) $\sqrt{3}-\sqrt{2}$ (c) $\sqrt{2}+1$ (d) $\sqrt{2}-1$

73. The value of $\sqrt{5+2\sqrt{6}}$ is

(a) $\sqrt{5}+\sqrt{6}$ (b) $\sqrt{5}-\sqrt{6}$ (c) $\sqrt{3}+\sqrt{2}$ (d) $\sqrt{3}-\sqrt{2}$

74. If $\sqrt{2} = 1.414$ then $\sqrt{\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)}} = ?$

(a) 0.207 (b) 2.414 (c) 0.414 (d) 0.621

75. If $x = 3+\sqrt{8}$ then $\left(x^2+\frac{1}{x^2}\right) = ?$

(a) 34 (b) 56 (c) 28 (d) 63

Assertion-and-Reason Type

Each question consists of two statements, namely, Assertion (A) and Reason (R). For selecting the correct answer, use the following code:

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A).

(b) Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Assertion (A).

(c) Assertion (A) is true and Reason (R) is false.

(d) Assertion (A) is false and Reason (R) is true.

76.

Assertion (A)	Reason (R)
Three rational numbers between $\frac{2}{5}$ and $\frac{3}{5}$ are $\frac{9}{20}, \frac{10}{20}$ and $\frac{11}{20}$.	A rational number between two rational numbers p and q is $\frac{1}{2}(p+q)$.

The correct answer is: (a)/(b)/(c)/(d).

77.

Assertion (A)	Reason (R)
$\sqrt{3}$ is an irrational number.	Square root of a positive integer which is not a perfect square is an irrational number.

The correct answer is: (a)/(b)/(c)/(d).

78.

Assertion (A)	Reason (R)
e is an irrational number.	π is an irrational number.

The correct answer is: (a)/(b)/(c)/(d).

79.

Assertion (A)	Reason (R)
$\sqrt{3}$ is an irrational number.	The sum of a rational number and an irrational number is an irrational number.

The correct answer is: (a)/(b)/(c)/(d).

Matching of Columns

80. Match the following columns:

Column I	Column II
(a) $6.\overline{54}$ is	(p) 14
(b) π is	(q) 6
(c) The length of period of $\frac{1}{7}$ = ...	(r) a rational number
(d) If $x = (2-\sqrt{3})$ then $\left(x^2+\frac{1}{x^2}\right)$ = ...	(s) an irrational number

The correct answer is:

(a)—..... , (b)—..... , (c)—..... , (d)—..... .

81. Match the following columns:

Column I	Column II
(a) $\sqrt[4]{(81)^{-2}}$ = ...	(p) 4
(b) If $\left(\frac{a}{b}\right)^{x-2} = \left(\frac{b}{a}\right)^{x-4}$ then x = ...	(q) $\frac{2}{9}$
(c) If $x = (9+4\sqrt{5})$ then $\left(\sqrt{x}-\frac{1}{\sqrt{x}}\right)$ = ...	(r) $\frac{1}{9}$
(d) $\left(\frac{81}{16}\right)^{-3/4} \times \left(\frac{64}{27}\right)^{-1/3}$ = ?	(s) 3

The correct answer is:

(a)—..... , (b)—..... , (c)—..... , (d)—..... .

ANSWERS (MCQ)

1. (d)	**2.** (a)	**3.** (c)	**4.** (d)	**5.** (c)	**6.** (d)	**7.** (c)	**8.** (b)
9. (d)	**10.** (d)	**11.** (d)	**12.** (d)	**13.** (b)	**14.** (c)	**15.** (d)	**16.** (a)
17. (b)	**18.** (c)	**19.** (d)	**20.** (d)	**21.** (d)	**22.** (c)	**23.** (d)	**24.** (a)
25. (b)	**26.** (c)	**27.** (b)	**28.** (c)	**29.** (d)	**30.** (c)	**31.** (d)	**32.** (c)
33. (b)	**34.** (c)	**35.** (b)	**36.** (b)	**37.** (b)	**38.** (c)	**39.** (a)	**40.** (b)
41. (b)	**42.** (b)	**43.** (c)	**44.** (b)	**45.** (d)	**46.** (a)	**47.** (b)	**48.** (a)
49. (c)	**50.** (b)	**51.** (c)	**52.** (d)	**53.** (a)	**54.** (d)	**55.** (b)	**56.** (b)
57. (b)	**58.** (c)	**59.** (a)	**60.** (d)	**61.** (d)	**62.** (b)	**63.** (d)	**64.** (b)
65. (d)	**66.** (d)	**67.** (c)	**68.** (c)	**69.** (b)	**70.** (c)	**71.** (b)	**72.** (d)
73. (c)	**74.** (c)	**75.** (a)	**76.** (a)	**77.** (a)	**78.** (b)	**79.** (b)	

80. (a)–(r), (b)–(s), (c)–(q), (d)–(p) **81.** (a)–(r), (b)–(s), (c)–(p), (d)–(q)

HINTS TO SOME SELECTED QUESTIONS

62. $$\frac{5^{n+2}-6\times5^{n+1}}{13\times5^{n}-2\times5^{n+1}}=\frac{5^{n+1}(5-6)}{5^{n}(13-2\times5)}=\frac{5^{n+1}\cdot(-1)}{5^{n}\cdot(13-10)}$$

$$=-\frac{1}{3}\cdot\frac{5^{n+1}}{5^{n}}=-\frac{1}{3}\cdot5^{(n+1)-n}=-\frac{1}{3}\times5=-\frac{5}{3}.$$

72. $\sqrt{3-2\sqrt{2}}=\sqrt{(\sqrt{2})^2+(1)^2-2\times\sqrt{2}\times1}=\sqrt{(\sqrt{2}-1)^2}=(\sqrt{2}-1).$

73. $\sqrt{5+2\sqrt{6}}=\sqrt{(\sqrt{2})^2+(\sqrt{3})^2+2\times\sqrt{2}\times\sqrt{3}}=\sqrt{(\sqrt{2}+\sqrt{3})^2}=(\sqrt{2}+\sqrt{3}).$

74. $$\sqrt{\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)}}=\sqrt{\frac{(\sqrt{2}-1)}{(\sqrt{2}+1)}\times\frac{(\sqrt{2}-1)}{(\sqrt{2}-1)}}=\sqrt{\frac{(\sqrt{2}-1)^2}{(\sqrt{2})^2-(1)^2}}=\sqrt{\frac{(\sqrt{2}-1)^2}{2-1}}$$

$$=\sqrt{(\sqrt{2}-1)^2}=\sqrt{2}-1=1.414-1=0.414.$$