INDIAN SCHOOL AL WADI AL KABIR

Department: Mathematics

Class IX Worksheet – Number System

Questions of 1 Mark each.

Q.1.	Find the simplest rationalizing factor of $\frac{1}{\sqrt{12}}$
Q.2.	Find the value of $\frac{16^{\frac{3}{4}}}{16^{\frac{-1}{4}}}$
Q.3.	Find two irrational numbers between 0.6 and 0.65
Q.4.	Find the value of $\frac{3+\sqrt{2}}{3-\sqrt{2}}$ if $\sqrt{2} = 1.414$
Q.5.	Find 5 rational numbers between $\frac{3}{4}$ and $\frac{4}{5}$
Q.6.	Find the value of $\sqrt{63} + \sqrt{112} + \sqrt{147}$
Q.7.	0.123333… can be expressed in the rational form as

Case study-based questions

Each question carries 1 mark

In a classroom activity on real numbers, the students have to pick a number card from a pile and frame a question on it if it is not a rational number for the rest of the class. The number cards picked up by first 5 students and their questions on the numbers for the rest of the class are as shown below. Answer them

Q.8. Suraj picked $\sqrt{8}$ and his question was: Which of the following is true about?

	A	It is a natural number	**B**	It is an irrational number	**C**	It is a rational number	**D**	None of these

Q.9. Shreya picked up 'BONUS CARD' and her question was: Which of the following is not irrational?

	A	$3 - 4\sqrt{5}$	**B**	$\sqrt{7} - 6$	**C**	$2 + 2\sqrt{9}$	**D**	$4\sqrt{11} - 6$

Q.10. Ananya picked up $\sqrt{15} - \sqrt{10}$ and her question was: What type of number is $\sqrt{15} - \sqrt{10}$

	A	a natural	**B**	an irrational	**C**	a whole	**D**	a rational

Q.11.	Suman picked up $\frac{50}{\sqrt{5}}$ and his question was: $\frac{50}{\sqrt{5}}$ can be rationalized as							
	A	$10\sqrt{5}$	**B**	$\frac{10}{\sqrt{5}}$	**C**	$5\sqrt{5}$	**D**	$20\sqrt{5}$
Q.12.	Ritika picked up a card of x and y, she came up with a question of: If x and y are two odd positive integers, then which of the following is true?							
	A	$x^2 + y^2$ is even	**B**	$x^2 + y^2$ is not divisible by 4	**C**	$x^2 + y^2$ is odd	**D**	both A and B
	Very Short Answer Questions of 2 marks each							
Q.13.	Express 1.8181… in the form $\frac{p}{q}$ where p and q are integers and q ≠ 0.							
Q.14.	If $x = 1 - \sqrt{2}$, find $x^2 + \frac{1}{x^2}$.							
Q.15.	Simplify: $\left\{5^2\left(8^{\frac{1}{3}} + 27^{\frac{1}{3}}\right)^3\right\}^{\frac{1}{5}}$.							
Q.16.	Find the value of x if $\left[\frac{5}{4}\right]^3 \times \left[\frac{4}{5}\right]^{-7} = \left[\frac{5}{4}\right]^{2x}$.							
Q.17.	Find 2 rational numbers and 2 irrational numbers between $\frac{3}{4}$ and $\frac{4}{5}$.							
	Short Answer Questions of 3 marks each							
Q.18.	Represent (i) $\sqrt{7.2}$ on the number line. (ii) $\sqrt{5}$ on the number line.							
Q.19.	Simplify and find the value of (i) $(729)^{\frac{1}{6}}$ (ii) $(21)^{\frac{3}{2}} \times (21)^{\frac{5}{2}}$ (iii) $(81)^{\frac{1}{3}} \div (81)^{\frac{1}{12}}$							
Q.20.	Evaluate: $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{9}{25}\right)^{\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$.							
Q.21.	Prove that $\frac{3^{30} + 3^{29} + 3^{28}}{3^{31} + 3^{30} - 3^{29}} = \frac{13}{33}$							
Q.22.	Simplify: $\left(2\sqrt{2} - 5\right)^2 + \left(3\sqrt{2} + \sqrt{3}\right)^2 - \left(\sqrt{2} - 1\right)^2$.							

	Long Answer Questions of 5 marks each
Q.23.	Show that $\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5.$
Q.24.	Find the value of a and b, if $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}.$
Q.25.	Simplify: $\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}} + \frac{2\sqrt{3}}{\sqrt{6}+2}.$

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Answers

Answers								
	1	$\sqrt{3}$	**2**	16	**3**	Any 2	**4**	2.7834
	5	Any 5	**6**	$7(\sqrt{7}+\sqrt{3})$	**7**	$\frac{37}{300}$	**8**	B
	9	C	**10**	B	**11**	A	**12**	D
	13	$\frac{20}{11}$	**14**	6	**15**	5	**16**	5
	17	Any 2	**18**	On number line	**19**	(i)3 (ii)21^4 (iii)3	**20**	1
	22	51-18$\sqrt{2}$+6$\sqrt{6}$	**24**	a=2, b= -1	**25**	0		