



INDIAN SCHOOL AL WADI AL KABIR

Class IX, Mathematics (2023-24)

Worksheet – NUMBER SYSTEM

SHORT ANSWER TYPE QUESTIONS (2 Marks each)

- Q1.** Find the value of $1.6666\dots$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
- Q2.** Find the product of $\sqrt[3]{2}$, $\sqrt[4]{2}$ and $\sqrt[12]{32}$.
- Q3.** Find which of the variables x, y, z, u, p, q, r and s represent rational numbers and which irrational numbers.
(i) $x^2 = 5$ (ii) $y^2 = 9$ (iii) $z^2 = 0.04$ (iv) $u^2 = \frac{17}{4}$
(v) $p = \sqrt{361}$ (vi) $q = \frac{5.63}{8}$ (vii) $r = 1.1010010001 \dots$ (viii) $s = 11.484848 \dots$
- Q4.** Insert two rational and two irrational numbers between the given numbers 6.374 and 6.375.

- Q5.** Represent the given numbers on the number line (i) $\sqrt{17}$ (ii) $\sqrt{5}$

- Q6.** Rationalise the denominator $\frac{1}{1+3\sqrt{2}}$.

SHORT ANSWER TYPE QUESTIONS. (3 Marks each)

- Q7.** Represent geometrically $\sqrt{8.6}$ on the number line.

- Q8.** Simplify $12\sqrt{18} - 6\sqrt{20} - 6\sqrt{50} + 10\sqrt{45}$.

- Q9.** Simplify by rationalizing the denominator: $\frac{2\sqrt{6}}{\sqrt{2} + \sqrt{3} + \sqrt{5}}$

- Q10.** If $(a + \frac{1}{a})^2 = 9$, then find $a^3 + \frac{1}{a^3}$.

- Q11.** Find the value of 'a' if $\frac{6}{3\sqrt{2}-2\sqrt{3}} = 3\sqrt{2} - a\sqrt{3}$.

- Q12.** Simplify: $\left\{ 5 \left(8^{\frac{1}{3}} + 27^{\frac{1}{3}} \right)^3 \right\}^{\frac{1}{4}}$.

- Q13.** Find the value of $(x - \frac{1}{x})^3$, if $x = 2 + \sqrt{3}$.

LONG ANSWER TYPE QUESTIONS. (4 Marks each)

Q14.	If $x = \frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}}$ and $y = \frac{\sqrt{7} - \sqrt{5}}{\sqrt{7} + \sqrt{5}}$, then find the value of $x^2 + y^2$.
Q15.	Find the values of a and b if $\frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}} = a + b\sqrt{3}$.
Q16.	Simplify $\frac{7\sqrt{3}}{\sqrt{10} + \sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6} + \sqrt{5}}$.
Q17.	If both 'a' and 'b' are rational numbers, then find 'a' and 'b' from $\frac{3 - \sqrt{5}}{3 + 2\sqrt{5}} = a\sqrt{5} - b$.
Q18.	Find the value of $\frac{1}{3 + \sqrt{8}} + \frac{1}{\sqrt{8} + \sqrt{7}} + \frac{1}{\sqrt{7} + \sqrt{6}} + \frac{1}{\sqrt{6} + \sqrt{5}} + \frac{1}{\sqrt{5} + 2}$.

ANSWERS

Q.1.	$\frac{5}{3}$	Q.2.	2	Q.3.	Rational numbers- y, z, p, q, s Irrational numbers-x, u, r		
Q.4.	Any two Rational numbers - 6.374333...., 6.3749 Irrational numbers- 6.374374537463..... 6.3749374493744493.....		Q.6.	$\frac{1 - 3\sqrt{2}}{-17}$	Q.8. $6(\sqrt{2} + 3\sqrt{5})$		
Q.9.	$\sqrt{2} + \sqrt{3} - \sqrt{5}$	Q.10.	18	Q.11.	$a = -2$	Q.12.	5
Q.13.	$24\sqrt{3}$	Q.14.	142	Q.15.	$a = 11, b = -6$	Q.16.	$7 - \sqrt{30}$
Q.17.	$a = \frac{9}{11}, b = \frac{19}{11}$	Q.18.	1				