

INDIAN SCHOOL AL WADI AL KABIR

Department: Mathematics

Class IX

Worksheet – Number Systems

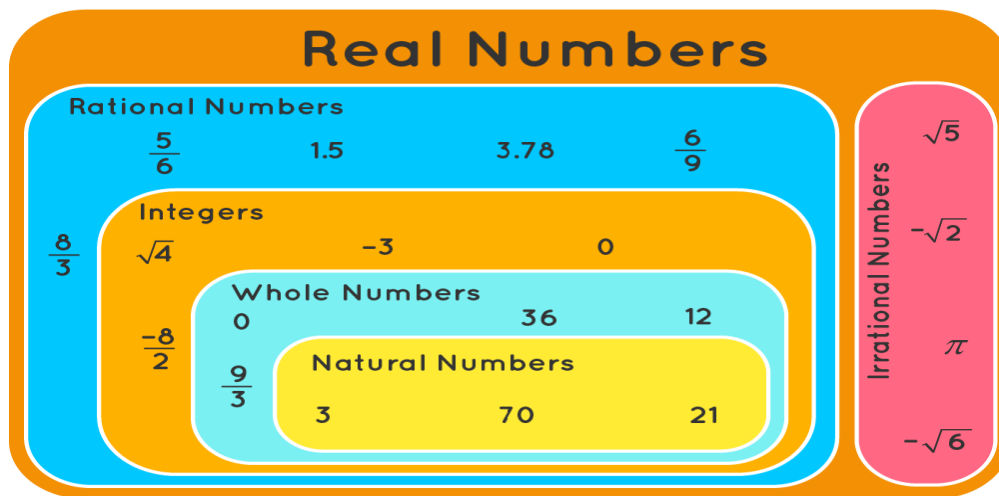
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1mark questions

Q.1.	Identify a rational number among the following numbers : $2 + \sqrt{2}$, $2\sqrt{2}$, 0 and π
Q.2.	Find the value of $\sqrt{(3)^{-2}}$
Q.3.	Find two irrational numbers between 2 and 2.5
Q.4.	How many rational numbers can be found between two distinct rational numbers?.
Q.5.	Divide $10\sqrt{15}$ by $5\sqrt{3}$
Q.6.	Write whether the rational number $\frac{327}{500}$ will have a terminating decimal expansion or a non-terminating repeating decimal expansion.
Q.7.	Find $(a + \sqrt{b})(a - \sqrt{b})$

Case study-based question (1 x 4 = 4 marks)

Q.8



Real numbers are the numbers which include both rational and irrational numbers. Rational numbers are the numbers which can be written in the form $\frac{p}{q}$ Where p and q are integers and $q \neq 0$. Irrational numbers are those numbers which cannot be expressed as a ratio of two integers.

Based on the above information answer the following questions.

- (a) Every rational number is
- Natural number
 - Whole number
 - An integer
 - A real number
- (b) The product of two irrational number is
- always rational
 - always irrational
 - always integer
 - Sometimes rational and sometimes irrational
- (c) Between two rational number
- There is no rational number
 - there is exactly one rational number
 - there are infinitely many irrational number
 - there is no irrational number
- (d) The sum of a rational and irrational number is
- Irrational
 - Rational
 - Both of the above
 - None of the above

2 marks questions

Q.9.	Express 1.8181... in the form $\frac{p}{q}$ where p and q are integers and $q \neq 0$.
Q.10.	Simplify : $\sqrt{45} - 3\sqrt{20} + 4\sqrt{5}$.
Q.11.	Evaluate : $(\sqrt{5} + \sqrt{2})^2 + (\sqrt{8} - \sqrt{5})^2$
Q.12.	Find 5 rational numbers between $\frac{3}{4}$ and $\frac{4}{5}$
Q.13.	Write the following rational numbers in decimal form and state which type of decimal expansion it is a) $3\frac{3}{8}$ b) $\frac{5}{6}$

3 marks questions

Q.14.	Represent $\sqrt{3.2}$ on the number line
Q.15.	If $a = \frac{1}{3-\sqrt{11}}$ and $b = \frac{1}{a}$, then find $a^2 - b^2$
Q.16.	Rationalize the denominator. a) $\frac{2}{\sqrt{3}-1}$ b) $\frac{1}{8+3\sqrt{5}}$
Q.17.	Simplify and find the value of a) $(729)^{\frac{1}{6}}$ b) $(21)^{\frac{3}{2}} \times (21)^{\frac{5}{2}}$ c) $(81)^{\frac{1}{3}} \div (81)^{\frac{1}{12}}$
Q.18.	Show how $\sqrt{3}$ can be represented on the number line:
Q.19.	Visualize $1.\overline{32}$ up to 4 decimal places.
Q.20.	If $x = 9 + 4\sqrt{5}$, find the value of $\sqrt{x} - \frac{1}{\sqrt{x}}$

5 marks questions	
Q.21.	Simplify: $\frac{3\sqrt{2}}{\sqrt{6}-\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{6}-\sqrt{2}} + \frac{2\sqrt{3}}{\sqrt{6}+2}$
Q.22.	Find a and b, if $\frac{2\sqrt{5}+\sqrt{3}}{2\sqrt{5}-\sqrt{3}} + \frac{2\sqrt{5}-\sqrt{3}}{2\sqrt{5}+\sqrt{3}} = a + \sqrt{15} b$
Q.23.	Prove that $\frac{1}{\sqrt{4+\sqrt{5}}} + \frac{1}{\sqrt{5+\sqrt{6}}} + \frac{1}{\sqrt{6+\sqrt{7}}} + \frac{1}{\sqrt{7+\sqrt{8}}} + \frac{1}{\sqrt{8+\sqrt{9}}} = 1.$

ANSWERS

Q.1	0	Q.2	$\frac{1}{3}$	Q.3	2.1001010.. 2.2300200..	Q.4	Infinite			
Q.5	$2\sqrt{5}$	Q.6	Terminating decimal	Q.7	$a^2 - b$	Q.8	a) d b) d c) c d) a			
Q.9	$\frac{20}{11}$	Q.10	$\sqrt{5}$	Q.11	$20-2\sqrt{10}$	Q.12	$\frac{151}{200}, \frac{152}{200}, \frac{153}{200}, \frac{154}{200}, \frac{155}{200}$			
Q.13	a)3.375, terminating decimal b)0.8333....., Non terminating recurring decimal	Q.15	$\frac{15\sqrt{11} - 30}{2}$	Q.16	a) $\sqrt{3}+1$ b) $\frac{8-3\sqrt{5}}{19}$	Q.17	a) 3 b) 194481 c) 3	Q.20	4	
Q. 21	0	Q.22	a) $\frac{46}{17}$ b)0							
