

1. NUMBER SYSTEM ①

Class: IX; MATHEMATICS

INTEGRATED + SOLUTIONS

TEACHING TASK
JEE MAINS LEVEL

2025/26

01. $\frac{4}{3} \rightarrow$ rational number, $\sqrt{3} \rightarrow$ Irrational no.
Ans: A

02. $\sqrt{3} = 1.732$, $\sqrt{5} = 2.23$
 $\therefore 1.732 < 2 < 2.23$

Ans: A

03. clearly $3 < \sqrt{11} < 4$

Ans: B

04. $a = \sqrt{3}$, $b = 2\sqrt{3} \Rightarrow a + b = \sqrt{3} + 2\sqrt{3} = 3\sqrt{3}$
an Irrational number

Ans: A

05. $2\sqrt{3}$

Ans: A

06. $\sqrt{7}$

Ans: A

07. $\sqrt{2} = 1.414$, $\sqrt{3} = 1.732$

clearly, $1.414 < 1.5 < 1.732$

Ans: A

08. let $a = \sqrt{2}$, $b = 2\sqrt{2} \Rightarrow ab = \sqrt{2} \times 2\sqrt{2} = 4$, rational no

let $a = \sqrt{2}$, $b = \sqrt{3} \Rightarrow ab = \sqrt{2} \times \sqrt{3} = \sqrt{6}$, Irrational

Ans: C

109	2 A) Sum of two irrational numbers is always an irrational (True) Ans: A Ans: C
110	$\sqrt{2} + 2 - \sqrt{2} = 2$ JEE ADVANCED LEVEL
111	$\frac{5}{\sqrt{2} + \sqrt{3}} \times \frac{\sqrt{2} - \sqrt{3}}{\sqrt{2} - \sqrt{3}} = \frac{5(\sqrt{2} - \sqrt{3})}{2 - 3} = -5(\sqrt{2} - \sqrt{3})$ Ans: A, B, C, D
112	$\frac{8}{\sqrt{5} + \sqrt{3}} \times \frac{\sqrt{5} - \sqrt{3}}{\sqrt{5} - \sqrt{3}} = \frac{8(\sqrt{5} - \sqrt{3})}{5 - 3} = 4(\sqrt{5} - \sqrt{3})$ Ans: A, B, C, D
113	Statement I: $\frac{5}{\sqrt{3} + \sqrt{2}} \times \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}} = \frac{5(\sqrt{3} - \sqrt{2})}{3 - 2} = 5(\sqrt{3} - \sqrt{2}) \text{ (True)}$ Statement II: True Ans: A
114	Statement I: $\frac{6}{\sqrt{3} - \sqrt{5}} \times \frac{\sqrt{3} + \sqrt{5}}{\sqrt{3} + \sqrt{5}} = \frac{6(\sqrt{3} + \sqrt{5})}{3 - 5} = \frac{6(\sqrt{3} + \sqrt{5})}{-2} \text{ (True)}$ Statement II: True Ans: A
115	Assertion: $\sqrt{3} \times \sqrt{12} = \sqrt{36} = 6$ Reason: Conceptual True Ans: A

16.	Assertion: $\sqrt{2} \times \sqrt{18} = \sqrt{36} = 6$ (True) ③ Reason: $\sqrt{2} \times \sqrt{18} = \sqrt{2 \times 18} = \sqrt{36} = 6$ (True) Ans: A
17	$(\sqrt{3})^2 (\sqrt{3})^3 = (\sqrt{3})^{2+3} = (\sqrt{3})^5$ Ans: D
18	$(\sqrt{3})^5 = \sqrt{3 \times 3 \times 3 \times 3 \times 3} = [(\sqrt{3})^2]^2 \times \sqrt{3} = 3^{5/2}$ Ans: B, C
19	$(\sqrt{2})^{-3} = \frac{1}{(\sqrt{2})^3} = \frac{1}{2\sqrt{2}}$ Ans: A
20	$\frac{1}{(\sqrt{2})^3} = \frac{1}{2\sqrt{2}}$ Ans: 10
21.	$\sqrt{5} \times \sqrt{20} = \sqrt{100} = 10$ Ans: 4
22	$\sqrt{2} \times \sqrt{8} = \sqrt{16} = 4$
23 a)	$\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$ (P)
b)	$\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$ (q)
c)	$\frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$ (r)
d)	$\frac{2}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} = \frac{2\sqrt{7}}{7}$ (s) Ans: P, Q, R, S

24 a) $\sqrt{6} \times \sqrt{2} = \sqrt{6 \times 2} = \sqrt{12}$ (P)

(4)

b) $\sqrt{18} = \sqrt{9 \times 2} = 3\sqrt{2}$ (Q)

c) $\sqrt{8} = \sqrt{4 \times 2} = 2\sqrt{2}$ ()

d) $\sqrt{7} \times \sqrt{3} = \sqrt{21}$ (S)

Ans: P, Q, —, S

LEARNERS TASK (CQULS)

01. $\sqrt{2}$

Ans: C

02. Conceptual

Ans: B

03. Conceptual

Ans: B

04. Conceptual

Ans: A, C,

05. Conceptual

Ans: A, C, D

06. $\frac{4}{5}$

Ans: C

07. Conceptual

Ans: C

08. $(a^m)^n = a^{m \times n}$; $a^0 = 1$ when $a \neq 0$

Ans: B, C

09. Conceptual

Ans: B

10. Let $a=2$, $b=\sqrt{3} \Rightarrow ab=2\sqrt{3}$ Irrational
Let $a=0$, $b=\sqrt{3} \Rightarrow ab=0$. rational Ans: C

(5)

JEE MAINS LEVEL

01

Conceptual

Ans: A, C,

02

 $1 < \sqrt{2} < 2$

Ans: B

03

Conceptual

Ans: C

04

A) $(a^m)^n = a^{mn}$ (True)
 C) $a^m \times a^n = a^{m+n}$ (True)

Ans: A, C

05

Conceptual

Ans: C

06

 $(\sqrt{2})^2 = 2\sqrt{2}, (\sqrt{2})^2 = 2$

Ans: C

07

$(a^m)^n = a^{mn}$ $a^{-n} = \frac{1}{a^n}$
 $a^0 = 1$ (when $a \neq 0$)

Ans: B, C, D

08

 $\sqrt{3}$

Ans: B

09

please change
 option B. They are always non-terminating
 and non-repeating.

Ans: B

10

Conceptual

Ans: D

11

$\frac{1}{\sqrt{3} + \sqrt{2}} \times \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}} = \frac{\sqrt{3} - \sqrt{2}}{3 - 2} = \sqrt{3} - \sqrt{2}$

Ans: A, C, D

$$12 \quad \frac{3}{\sqrt{7}-\sqrt{2}} \times \frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}+\sqrt{2}} = \frac{3(\sqrt{7}+\sqrt{2})}{7-2} = \frac{3(\sqrt{7}+\sqrt{2})}{5} \quad (6)$$

Ans: A, B, C

$$13 \quad \text{Statement I: } \frac{3}{\sqrt{6}-\sqrt{3}} \times \frac{\sqrt{6}+\sqrt{3}}{\sqrt{6}+\sqrt{3}} = \frac{3[\sqrt{6}+\sqrt{3}]}{3} \quad (\text{True})$$

Ans: A

Statement II: True

$$14 \quad \text{Statement I: } \frac{9}{\sqrt{7}+\sqrt{3}} \times \frac{\sqrt{7}-\sqrt{3}}{\sqrt{7}-\sqrt{3}} = \frac{9(\sqrt{7}-\sqrt{3})}{7-3} = \frac{9(\sqrt{7}-\sqrt{3})}{4} \quad (\text{True})$$

Ans: A

Statement II: True

$$15 \quad \text{Assertion: } \sqrt{8} + \sqrt{2} = 2\sqrt{2} + \sqrt{2} = 3\sqrt{2}, \text{ Disasserted} \quad (\text{True})$$

Ans: A

Reason: Conceptual (True)

$$16 \quad \text{Assertion: } \sqrt{12} - \sqrt{3} = 2\sqrt{3} - \sqrt{3} = \sqrt{3} \quad (\text{False})$$

Reason: False

Ans: —

$$17 \quad (\sqrt{2})^4 = 2^2 = 4$$

Ans: D

$$18 \quad \sqrt{2}^4 = (\sqrt{2})(\sqrt{2})(\sqrt{2})(\sqrt{2}) = 4$$

Ans: D

$$19 \quad 1$$

Ans: D

$$20 \quad a^0 = 1 \Rightarrow a \neq 0$$

Ans: A

17

21. $(\sqrt{8})^2 = 8$

Ans: 8

22. $\sqrt{13} \times \sqrt{13} = (\sqrt{13})^2 = 13$

Ans: 13

23. Change the optime.

a) $\sqrt{a} \times \sqrt{b} = \sqrt{ab} \rightarrow \sqrt{2} \times \sqrt{8} = \sqrt{16}$

b) $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}} \rightarrow \frac{\sqrt{5}}{\sqrt{2}} = \sqrt{\frac{5}{2}}$

c) $(a^m)^n = a^{mn} \rightarrow (\sqrt{3})^2 = (3^{\frac{1}{2}})^2 = 3^{\frac{1}{2} \times 2} = 3$

d) $a^0 = 1 \rightarrow (\sqrt{2})^0 = 1$

Ans: p, q, r, s

24 a) Conceptual $\rightarrow p$

b) Conceptual $\rightarrow q$

c) Conceptual $\rightarrow r$

d) Conceptual $\rightarrow d$

Ans: p, q, r, s

$\Rightarrow$ THE END $\in$