

1. NUMBER SYSTEM

①

Class: VIII, Mathematics

FOUNDATION
SOLUTIONS

(2025-26)

TEACHING TASKS
JEEMAINS LEVEL



01. $\sqrt{20} = 2\sqrt{5}$, is an irrational number

Ans: B

02. We know $\sqrt{3} \approx 1.732$ $\sqrt{5} \approx 2.236$.
 $\therefore$ clearly, $\sqrt{3} < 2\sqrt{5}$

Ans: A

03. We know, $\sqrt{11} \approx 3.3166$
Clearly, $3 < \sqrt{11} < 4$.

Ans: B

$$\begin{aligned} 04. (\sqrt{2}+1)^2 &= (\sqrt{2})^2 + 2 \cdot \sqrt{2} \cdot 1 + (1)^2 \\ &= 2 + 2\sqrt{2} + 1 \\ &= 3 + 2\sqrt{2} \end{aligned}$$

Ans: B

$$05. \frac{5}{\sqrt{3}-\sqrt{2}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} = 5(\sqrt{3}+\sqrt{2})$$

Ans: A

06. $\sqrt{7} \rightarrow$ decimal expansion is non-terminating
non-repeating

Ans: B

07. We know, $\frac{1}{3} = 0.333$, $\frac{1}{2} = 0.5$

Now, option A: $\frac{1}{3} + \frac{\sqrt{2}}{10}$

$$= 0.333 + \frac{1.414}{10}$$

$$= 0.333 + 0.1414$$

$$= 0.4747.$$

clearly $\frac{1}{3} < \frac{1}{3} + \frac{\sqrt{2}}{10} < \frac{1}{2}$

Ans: A

08. Let $a = \sqrt{3}$, $b = \sqrt{27}$.

Now $a \times b = \sqrt{3} \times \sqrt{27} = \sqrt{81} = 9$, which is a rational number.

Ans: C

09. ~~statement e, is always~~

09. c) The product of two irrational numbers is sometimes rational (or) some times irrational

Ans: C

10. $x^2 - 2 = (\sqrt{2})^2 - 2 = 2 - 2 = 0$

Ans: A

JEE ADVANCED LEVEL

01. $\frac{5}{\sqrt{2} + \sqrt{3}} \times \frac{\sqrt{2} - \sqrt{3}}{\sqrt{2} - \sqrt{3}} = \frac{5(\sqrt{2} - \sqrt{3})}{2 - 3} = \frac{5(\sqrt{2} - \sqrt{3})}{-1}$

$$= -5(\sqrt{2} - \sqrt{3}).$$

Ans: A, B, C, D.

02. Conceptual

Ans: A, B, C

03. Statement I: The rationalized form of (03)

$$\frac{5}{\sqrt{3} + \sqrt{2}} \times \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} - \sqrt{2}} = \frac{5(\sqrt{3} - \sqrt{2})}{1} \text{ (True)}$$

Statement II: To rationalise the denominator of $\frac{5}{\sqrt{3} + \sqrt{2}}$, we have to multiply the numerator and denominator by $\sqrt{3} - \sqrt{2}$ (True)

Ans: A

04. Statement I: Conceptual (True)

Statement II: Conceptual (True)

Ans: A

05. Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

06. Assertion: $\sqrt{2} \times \sqrt{18} = \sqrt{36} = 6$ (True)

Reason: True

Ans: A

$$07. (\sqrt{3})^2 \times (\sqrt{3})^3 = (\sqrt{3})^5$$

Ans: D

$$08. (\sqrt{3})^5 = 3^{5/2}$$

Ans: B

$$09. \sqrt{50} = 5\sqrt{2}, \text{ Irrational Number}$$

Ans: B

$$10. \text{ We have } \sqrt{50} = 5\sqrt{2} = 5 \times 1.414 = 7.070$$
$$7 < \sqrt{50} < 8$$

Ans: B

11. $\sqrt{5} \times \sqrt{20} = \sqrt{5 \times 20} = \sqrt{100} = 10.$

Ans: 10

12. $x = \frac{1}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}-1} = \frac{\sqrt{3}-1}{2} = \frac{a(\sqrt{3}-1)}{b}$

Comparing, $a=1$, $b=2 \Rightarrow a+b=1+2=3$
 Ans: 3

13 a) $\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

b) $\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

c) $\frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$

d) $\frac{2}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} = \frac{2\sqrt{7}}{7}$

Ans: p, q, r, s

14 a) $\sqrt{10} = 3.1623$

clearly $3.1 < \sqrt{10} < 3.2$

b) $\sqrt{2} + \sqrt{2} = 2\sqrt{2} = 2 \times 1.414 =$

c) $\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

d) $\sqrt{25} = 5$

Ans: q, p, s, r

LEARNERS TASK

05

CUQ'S

01. opt: B $\Rightarrow \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2} = \frac{1.414}{2} = 0.707$

Ans: B

$\therefore 0 < \frac{1}{\sqrt{2}} < 1$

02. Conceptual.

Ans: B

03. clearly. $\sqrt{10} = 3.16$, $\sqrt{11} = 3.31$
 $\sqrt{12} = 3.46$, $\sqrt{16} = 4$.

Ans: D

04. We know, $\pi = 3.14$ (approx).

$\therefore 3 < \pi < 4$.

Ans: A

* 05. A) Adding two irrational numbers is always irrational number

c) Dividing an irrational number by a rational number is always irrational number

B) rational number + irrational number = irrational number

Ans: A, C, D

06. Conceptual

Ans: B

07. Conceptual

Ans: C

08. B) $(a^m)^n = a^{mn}$

06
Ans: B

09. Conceptual:

Ans: B

10. $\sqrt{3} \times \sqrt{3} = 3$, rational

Ans: B

IEEE MAINS LEVEL

01

A) Irrational number + Irrational number
= Irrational number

B) Irrational number + Rational number
= Irrational number

C)

Ans: A, C

02. clearly, $1 < \sqrt{2} < 2$

Ans: B

03. $(2^{\frac{1}{2}})^2 = 2^{\frac{1}{2} \times 2} = 2$

Ans: A

04. $a^4 = (\sqrt{2})^4 = 2^2 = 4$

Ans: B

05. Conceptual.

Ans: C

06. Conceptual.

Ans: C

07. conceptual

Ans: C

- *** 08 NOTE: Which of the following Expressions will be Irrational? (07)
- A) $\frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$, Irrational
- B) $\frac{1}{\sqrt{3}+1} \times \frac{(\sqrt{3}-1)}{(\sqrt{3}-1)} = \frac{(\sqrt{3}-1)}{2}$, Irrational
- C) $\frac{1}{\sqrt{7}-\sqrt{2}} \times \frac{(\sqrt{7}+\sqrt{2})}{(\sqrt{7}+\sqrt{2})} = \frac{(\sqrt{7}+\sqrt{2})}{5}$, Irrational
- D) None
- Ans: D

09. Conceptual

Ans: A

10. $\sqrt{20} = 2\sqrt{5} = 4.472 \approx 4.4$

Ans: B

JEE ADVANCED

01. A) $a^m \times a^n = a^{m+n}$ (True)

B) $(a^m)^n = a^{mn}$ (True)

D) $a^0 = 1$ for $a \neq 0$ (True)

Ans: A, B, D

02. A) True

B) True

C) True

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

Ans: A, B, C

03. Statement I: $\frac{3}{\sqrt{6}-\sqrt{3}} \times \frac{(\sqrt{6}+\sqrt{3})}{(\sqrt{6}+\sqrt{3})}$

$$= \frac{3(\sqrt{6}+\sqrt{3})}{\sqrt{6}+\sqrt{3}} = \sqrt{6}+\sqrt{3} \text{ (True)}$$

Statement II: (True)

Ans: A



04. Statement I: True

(08)

Statement II: True

Ans: A

05. Assertion: False, π is an Irrational number

Reason: True

Ans: D

* 06. Assertion: $\sqrt{12} - \sqrt{3} = 2\sqrt{3} - \sqrt{3} = \sqrt{3} \neq \sqrt{9}$
(False)

Reason: $\sqrt{12} - \sqrt{3}$ simplifies to $\sqrt{3}$. (False)

07. $2\sqrt{2} \rightarrow$ Irrational number

Ans: B

08. Power of a power

Ans: C

09. $(\sqrt{2})^0 = 1$

Ans: D

10. $a^0 = 1$, where when $a \neq 0$

Ans: A

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

Ans: 8

12. $((\sqrt{2})^2)^3 = (2)^3 = 8$

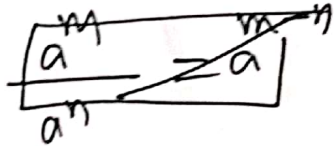
Ans: 8

13

a) $a^m \times a^n = a^{m+n}$

$$\sqrt{2} \times \sqrt{8} = \sqrt{2} \times 2\sqrt{2}$$

$$= (\sqrt{2})^2 \times 2 = 4$$

b)  $\Rightarrow \frac{a^m}{b^m} = \left(\frac{a}{b}\right)^m$

$$\frac{\sqrt{5}}{\sqrt{2}} = \sqrt{\frac{5}{2}}$$

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

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

Ans: P, -, x, S

14

a) $\sqrt{11} \rightarrow$ Irrational Number

b) $\sqrt{49} = 7 \rightarrow$ Rational

c) $0.333 \dots \rightarrow$ Repeating decimal

d) $\sqrt{2} + \sqrt{3} \rightarrow$ Irrational

Ans: i, P, S, i

$\Rightarrow$ THE END $\Leftarrow$