

SQUARE, SQUARE ROOTS (1) AND CUBE, CUBE ROOTS

Class: VII, Mathematics

SOLUTIONS

TEACHING TASK

01. $\sqrt{\frac{25}{81} \cdot \frac{1}{9}} = \sqrt{\frac{144}{219}}$
 $= \sqrt{\frac{225 \cdot 81}{81 \times 9}} = \frac{12}{9} = \frac{4}{3}$ Ans: B

02. $\frac{52}{x} = \sqrt{\frac{169}{289}}$
 $\Rightarrow \frac{52}{x} = \frac{13}{17}$
 $\Rightarrow x = \frac{52 \times 17}{13} = 68$ Ans: D

03. $\sqrt{1 + \frac{x}{169}} = \frac{14}{13}$
 $\Rightarrow 1 + \frac{x}{169} = \frac{196}{169}$
 $\Rightarrow 169 + x = 196$
 $\Rightarrow x = 196 - 169 = 27$ Ans: C

04. $\sqrt{\frac{x}{169}} = \frac{54}{13}$
 $\frac{x}{169} = \frac{324}{169}$
 $x = 324$ Ans: B

05 $3645 = 3^6 \times 5$ (2)
 Smallest number = 5 Ans: B

06 $6000 = 2^2 \times 2^2 \times 3^2 \times 5^2 \times 5$
 The smallest number = $3 \times 5 = 15$ Ans: A

07 $\sqrt[3]{-17576} = \sqrt[3]{(-26)^3} = -26$ Ans: B

08 $\sqrt[3]{\frac{8}{125000}} = \sqrt[3]{\left(\frac{8}{50}\right)^3} = \frac{8}{50} = \frac{4}{25}$
 $\frac{4}{25} = 0.16$ Ans: B

09 $\sqrt[3]{4 \frac{12}{125}} = \sqrt[3]{\frac{512}{125}} = \sqrt[3]{\left(\frac{8}{5}\right)^3} = \frac{8}{5}$ Ans: C

10 $\sqrt[3]{0.125} = \sqrt[3]{(0.5)^3} = 0.5$ Ans: B

11. $161^2, 109^2$ ends with $\frac{x}{y}$
 $\sin |x| = \frac{1}{9}, 9 \times 9 = 81$ Ans: A, C

12 All are pythagorean triplets
 Since A) $(2p)^2 + (p^2-1)^2 = (p^2+1)^2$
 B) $3^2 + 4^2 = 5^2$
 C) $5^2 + 12^2 = 13^2$
 D) $8^2 + 15^2 = 17^2$ Ans: A, B, C, D

13 Statement I (3)

$$1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

$$1^2 + 2^2 + 3^2 + \dots + 10^2 = \frac{10 \times 11 \times 21}{6} \neq 55$$

(False)

Statement II: Conceptual (True) Ans: D

14 $1752 + 12 = 1764 = (42)^2$ Ans: 12

15 $\sqrt[3]{392} \times \sqrt[3]{448}$

$$= \sqrt[3]{392 \times 448}$$

A $\sqrt[3]{(56)^3} = 56$ Ans: A

16 $a^3 = 46656$

$$\Rightarrow a^3 = (36)^3$$

$$\Rightarrow a = 36$$

Ans: 36

17

a) $1^2 + 2^2 + 3^2 = 1 + 4 + 9 = 14$

b) $2^2 + 3^2 + 6^2 = 4 + 9 + 36 = 49 = 7^2$

c) $3^2 + 4^2 + 12^2 = 9 + 16 + 144 = 169 = 13^2$

d) $4^2 + 5^2 + 20^2 = (21)^2$ Ans: -, r, q, t

LEARNER'S TASK

01. $121 = (11)^2$ Ans: B

02. $2161 \neq ()^2$ Ans: D

03 If a square a two digit numbers, the unit's digits should be either (4) 0, 1, 4, 9, 6, ... Ans: B

04 P^2 and $(P+1)^2$ are consecutive squares. Since P and $P+1$ are consecutive, Ans: C

05 $1^2 = 1$
 $11^2 = 121$
 $111^2 = 1221$ etc.
These are palindromes. Ans: C

06 $144^2 = \boxed{6}^2 = 36$ Ans: A

07 $1^3 = 1, 2^3 = 8, 3^3 = 27, 4^3 = 64, 5^3 = 125$
 $6^3 = 216, 7^3 = 343, 8^3 = 512$ Ans: B
Nos = 6

08 $\sqrt[3]{-343} = \sqrt[3]{(-7)^3} = -7$ Ans: C

09 $27000 = (30)^3$ Ans: C

10 $(2013)^3 = \underline{\quad\quad\quad}^7$ Ans: D
Since $3 \times 3 \times 3 = 27$

JEE MAINS LEVEL

01 $2300 + 4 = 2304 = (48)^2$ Ans: D

02 $6096 - 12 = 6084$
 $= (78)^2$ (5)

∴ Each zero 78 Ans: A

03 $a^2 = 72 \times 338$
 $= 24336$
 $= (156)^2$ Ans: C

04 $\sqrt{53824} = (232)^2$ Ans: B

05 $\sqrt{0.00004761} = (0.0069)^2$ ~~Ans: B~~
 $\therefore 0.00004761 = \sqrt{\frac{4761}{100000000}}$
 $= \sqrt{\left(\frac{69}{10000}\right)^2} = \frac{69}{10000} = 0.0069$

Ans: B

06 $\sqrt{3^n} = 729$
 $\Rightarrow 3^{\frac{n}{2}} = 729 \times 729$
 $\Rightarrow 3^{\frac{n}{2}} = 3^6 \times 3^6 = 3^{12} \therefore n = 12$ Ans: D

07 $2 \overline{) 288}$
 $2 \overline{) 144}$
 $2 \overline{) 72}$
 $2 \overline{) 36}$
 $2 \overline{) 18}$
 $3 \overline{) 9}$
 3
 $288 = 2^3 \times 2^2 \times 3^2 = 2^5 \times 3^2$
 least number = $2 \times 3 = 6$ Ans: A

08 $1029 = 3 \times 7^3$
 least number = $3 \times 7 = 21$ Ans: C

09. $\sqrt[3]{\frac{125}{216}} = \sqrt[3]{\left(\frac{5}{6}\right)^3} = \frac{5}{6}$ Ans: A (6)

10. $\sqrt[3]{0.000013824}$
 $= \sqrt[3]{\frac{13824}{10000000000}}$
 $= \sqrt[3]{\left(\frac{24}{1000}\right)^3}$
 $= \frac{24}{1000} = 0.024$ Ans: C

11. $2^x = \sqrt[3]{32}$
 $\Rightarrow 2^x = (32)^{\frac{1}{3}}$
 $\Rightarrow 2^x = 2^{\frac{5}{3}}$
 $\Rightarrow x = \frac{5}{3}$ Ans: B

12. Statement I:
 We know
 $1^3 + 2^3 + 3^3 + \dots + n^3 = \frac{n^2(n+1)^2}{4}$
 $= \left(\frac{n(n+1)}{2}\right)^2$
 here
 $1^3 + 2^3 + 3^3 + \dots + 15^3 = \left(\frac{15(15+1)}{2}\right)^2$
Statement II: Conceptual (True) Ans: A

13. 1234321 \rightarrow Palindrome Ans: A

14. $13^3 + 25^3$ Since $3^3 = 27$ (7) (7)

$$= \frac{7}{2} + \frac{5}{2}$$

$$= \frac{12}{2}$$

$5^3 = 125$ (5) (5)

15 a) $381 = (19)^2 \therefore \sqrt{381} = 19$

b) $3375 = (15)^3 \therefore \sqrt[3]{3375} = 15$

c) $729 = (27)^2 \therefore \sqrt{729} = 27$

d) $1728 = (12)^3 \therefore \sqrt[3]{1728} = 12$

Ans: r, s, q, p

⇒ THE END ⇐