

Assignment 1

Q.8: (d)

How many prime numbers are between each of the following pairs of numbers?

i) $\sqrt{3}$ and $\sqrt{120}$

$$\sqrt{3}$$

$$x=3, y=4$$

$$\frac{3+4}{2\sqrt{4}}$$

$$= \frac{3+4}{2 \times 2} =$$

$$= \frac{7}{4} = 1.75$$

$$\sqrt{120}$$

$$x=120, y=121$$

$$= \frac{120+121}{2\sqrt{121}}$$

$$= \frac{241}{2 \times 11}$$

$$\begin{array}{r} 1.75 \\ 4 \overline{) 7} \\ \underline{4} \\ 30 \\ \underline{28} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

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$$\begin{array}{r} = 241 \\ 22 \end{array}$$

$$= 10.95$$

$$\begin{array}{r} 10.95 \\ 22 \overline{) 241} \\ \underline{220} \\ 210 \\ \underline{198} \\ 120 \\ \underline{110} \\ 10 \end{array}$$

The prime numbers between $\sqrt{3}$ and $\sqrt{120}$ are 2, 3, 5, 7.

No. of prime numbers = 4

ii) $\sqrt[3]{10}$ and $\sqrt[2]{410}$

$$\begin{array}{l} x=10 \quad y=9 \\ = \frac{10+9}{2\sqrt{9}} \end{array}$$

$$= \frac{19}{2 \times 3}$$

$$= \frac{19}{6} = 3.16$$

$$2\sqrt{10} = 2 \times 3.16 = 6.32$$

$$\sqrt[2]{410}$$

$$\begin{array}{l} x=410 \quad y=400 \\ = \frac{410+400}{2\sqrt{400}} \end{array}$$

$$= \frac{810}{2 \times 20}$$

$$= \frac{810}{40}$$

$$= 20.25$$

$$2\sqrt{410} = 2 \times 20.25 = 40.5$$

$$\begin{array}{r} 3.16 \\ 6 \overline{) 19} \\ \underline{18} \\ 10 \\ \underline{6} \\ 40 \\ \underline{36} \\ 4 \end{array}$$

$$\begin{array}{r} 20.25 \\ 40 \overline{) 810} \\ \underline{800} \\ 100 \\ \underline{80} \\ 200 \\ \underline{200} \\ 0 \end{array}$$

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The prime numbers between $\sqrt[3]{10}$ and $\sqrt[2]{410}$ are ~~7~~ 7, 11, 13, 17, 19, 23, 29, 31, 37

No. of Prime numbers = 9

iii) $\sqrt[3]{10}$ and $\sqrt[3]{999}$

$\sqrt[3]{10}$

$$P = 10 \quad q = 8$$

$$\sqrt[3]{P} = \sqrt[3]{q} + \frac{P-q}{3[\sqrt[3]{q}]^2}$$

$$= \sqrt[3]{8} + \frac{10-8}{3[\sqrt[3]{8}]^2}$$

$$= 2 + \frac{10-8}{3[2]^2}$$

$$= 2 + \frac{2}{3 \times 4}$$

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

$$= \frac{24+2}{12}$$

$$= \frac{26}{12}$$

$$= 2.16$$

$$\begin{array}{r} 2.16 \\ 12 \overline{) 26} \\ \underline{24} \\ 20 \\ \underline{12} \\ 80 \\ \underline{72} \\ 8 \end{array}$$

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$$\sqrt[3]{999}$$

$$p = 999 \quad q = 1000$$

$$\sqrt[3]{999} = \sqrt[3]{1000} + \frac{999 - 1000}{3[\sqrt[3]{1000}]^2}$$

$$= 10 + \frac{999 - 1000}{3(10)^2}$$

$$= 10 + \frac{(-1)}{3 \times 100}$$

$$= 10 - \frac{1}{300}$$

$$= \frac{3000 - 1}{300}$$

$$= \frac{2999}{300}$$

$$= 9.99$$

$$\begin{array}{r} 9.99 \\ 300 \overline{) 2999} \\ \underline{2700} \\ 2990 \\ \underline{2700} \\ 2900 \\ \underline{2700} \\ 200 \end{array}$$

The prime number between $\sqrt[3]{10}$ and $\sqrt[3]{999}$ are 3, 5, 7

No. of prime numbers = 3

iv) $\sqrt[3]{28}$ and $\sqrt{120}$

$$p = 28 \quad q = 27$$

$$\sqrt[3]{28} = \sqrt[3]{27} + \frac{28 - 27}{3[\sqrt[3]{27}]^2}$$

$$= 3 + \frac{1}{3 \times (3)^2}$$

$$= 3 + \frac{1}{3 \times 9}$$

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$$= \frac{3+1}{27}$$

$$= \frac{81+1}{27}$$

$$= \frac{82}{27}$$

$$= 3.037 \approx 3.04$$

$$\sqrt{120}$$

$$x=120 \quad y=121$$

$$\sqrt{120} = \frac{120+121}{2\sqrt{121}}$$

$$= \frac{241}{2 \times 11}$$

$$= \frac{241}{22} = 10.95$$

$$3.037$$

$$27 \sqrt{82}$$

$$\underline{81}$$

$$100$$

$$\underline{81}$$

$$190$$

$$\underline{189}$$

$$1$$

$$10.95$$

$$22 \sqrt{241}$$

$$\underline{220}$$

$$210$$

$$\underline{198}$$

$$120$$

$$\underline{110}$$

$$10$$

The prime numbers between

$\sqrt[3]{28}$ and $\sqrt{120}$ are 5, 7

No. of prime numbers = 2

v) $\sqrt[3]{8}$ and $\sqrt{400}$

$$\sqrt[3]{8} = \frac{8+9}{2\sqrt[3]{9}}$$

$$= \frac{17}{2 \times 3}$$

$$= \frac{17}{6}$$

$$= 2.83$$

$$2.83$$

$$6 \sqrt{17}$$

$$\underline{12}$$

$$50$$

$$\underline{48}$$

$$20$$

$$\underline{18}$$

$$2$$

$$2\sqrt[3]{8} = 2 \times 2.83 = 5.66$$

$$\begin{aligned}\sqrt{400} \\ &= \sqrt{(20)^2} \\ &= 20\end{aligned}$$

The prime numbers between $\sqrt{8}$ and 400 are 7, 11, 13, 17, 19

No. of prime numbers = 5

Q. NO 2: Find the missing terms

1. $2, 3, 6, 4, 5, 20, \underline{6}, 3, 18$

$\begin{array}{ccccccc} & & \times & & \times & & \times \\ \underbrace{2 \times 3} & \underbrace{4 \times 5} & \underbrace{20 \times 6} & \underbrace{3 \times 18} \end{array}$

2. $1, 3, 9, 15, 25, \underline{35}, 49$

$\begin{array}{ccccccc} & +2 & +4 & +6 & +8 & +10 & +12 \\ \underbrace{1 \rightarrow 3} & \underbrace{3 \rightarrow 9} & \underbrace{9 \rightarrow 15} & \underbrace{15 \rightarrow 25} & \underbrace{25 \rightarrow 35} & \underbrace{35 \rightarrow 49} \end{array}$

$\begin{array}{ccccccc} & 3^2 & & 5^2 & & 7^2 \\ \underbrace{1} & \underbrace{3} & \underbrace{9} & \underbrace{15} & \underbrace{25} & \underbrace{35} & \underbrace{49} \end{array}$

3. $2, 7, 10, 22, 18, 37, 26, \underline{52}$

$\begin{array}{ccccccc} & +8 & & +8 & & +8 & \\ \underbrace{2 \rightarrow 10} & \underbrace{7 \rightarrow 18} & \underbrace{10 \rightarrow 26} & \underbrace{22 \rightarrow 37} & \underbrace{18 \rightarrow 52} \end{array}$

$\begin{array}{ccccccc} & 15 & & 15 & & 15 & \\ \underbrace{2} & \underbrace{7} & \underbrace{10} & \underbrace{22} & \underbrace{18} & \underbrace{37} & \underbrace{26} \end{array}$

4. $34, 7, 37, 14, 40, 28, 43, \underline{56}$

$\begin{array}{ccccccc} & +3 & & +3 & & +3 & \\ \underbrace{34 \rightarrow 37} & \underbrace{7 \rightarrow 10} & \underbrace{37 \rightarrow 40} & \underbrace{14 \rightarrow 17} & \underbrace{40 \rightarrow 43} & \underbrace{28 \rightarrow 31} & \underbrace{43 \rightarrow 46} \end{array}$

$\begin{array}{ccccccc} & \times 2 & & \times 2 & & \times 2 & \\ \underbrace{34} & \underbrace{7} & \underbrace{37} & \underbrace{14} & \underbrace{40} & \underbrace{28} & \underbrace{43} \end{array}$

5. $5, 7, 11, 13, 17, 19$

$\begin{array}{ccccccc} & +2 & & +4 & & +2 & \\ \underbrace{5 \rightarrow 7} & \underbrace{7 \rightarrow 11} & \underbrace{11 \rightarrow 13} & \underbrace{13 \rightarrow 17} & \underbrace{17 \rightarrow 19} \end{array}$

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QNO.3: Find the missing terms in the following

1: $2, 4, 12, 48, \underline{240}$
 $\underbrace{2 \times 2}_{\times 2}, \underbrace{4 \times 3}_{\times 3}, \underbrace{12 \times 4}_{\times 4}, \underbrace{48 \times 5}_{\times 5}$

2: $5, 10, 13, 26, 29, 58, 61, \underline{122}$
 $\underbrace{5 \times 2}_{\times 2}, \underbrace{10 \times 1.3}_{\times 1.3}, \underbrace{13 \times 2}_{\times 2}, \underbrace{26 \times 2}_{\times 2}, \underbrace{29 \times 2}_{\times 2}, \underbrace{58 \times 2}_{\times 2}, \underbrace{61 \times 2}_{\times 2}$

3: $15, 19, 28, \underline{44}, 69, 105$
 $\underbrace{15 \times 1.2}_{\times 1.2}, \underbrace{19 \times 1.5}_{\times 1.5}, \underbrace{28 \times 1.6}_{\times 1.6}, \underbrace{44 \times 1.25}_{\times 1.25}, \underbrace{69 \times 1.5}_{\times 1.5}, \underbrace{105 \times 1.5}_{\times 1.5}$

4: $B, F, K, W, \underline{U}$
 $2, 5, 11, 23, \underline{47}$
 $\underbrace{2 + 3}_{+3}, \underbrace{5 + 6}_{+6}, \underbrace{11 + 12}_{+12}, \underbrace{23 + 24}_{+24}$

$47 - 26 = 21$

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$$5. \{(476 + 424)^2 - 4 \times 476 \times 424\} = ?$$

$$= (900)^2 - 807296$$

$$= 8,10,000 - 8,07,296$$

$$= 2,704$$

Add steps

Add given, asked, solution,
formula, answer