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Batch: 085

GSA- Maths:

Q8 (d)

How many prime nos are between each of the following pairs.

1) $\sqrt{3}$ & $\sqrt{120}$

Formula: $\sqrt{n} = \frac{x+y}{2}$

$$\sqrt{3} = \frac{x+y}{2} = \frac{3+4}{2} = \frac{3+4}{2}$$

$x=3$
 $y=4$

$$= \frac{7}{2} = \frac{7}{2} = 1.75$$

$$\begin{array}{r} 1.75 \\ 4 \overline{) 7} \\ 4 \\ \hline 230 \\ 28 \\ \hline 20 \\ 20 \\ \hline \times \times \end{array}$$

$$\sqrt{120} = \frac{120+121}{2} = \frac{241}{2}$$

$x=120$
 $y=121$

$$= \frac{241}{2} = \frac{241}{2} = 120.5$$

$$= 10.954$$

$$\begin{array}{r} 10.954 \\ 22 \overline{) 241} \\ 220 \\ \hline 210 \\ \hline 198 \\ \hline 120 \\ \hline 110 \\ \hline 100 \\ \hline 88 \\ \hline 12 \end{array}$$

$\therefore$ we need prime no between 1.75 and 10.95 that includes 2, 3, 5, 7. Ans.

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

$$\sqrt{10} = \frac{x+y}{2} = \frac{10+9}{2} = \frac{19}{2}$$

$x=10$
 $y=9$

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

$$\frac{19}{6} = 3.1666$$

$$\begin{array}{r} 3.166 \\ 6 \overline{) 19} \\ \underline{18} \\ 10 \end{array}$$

$$2\sqrt{410}: \frac{n+y}{2\sqrt{y}}$$

$$n = 410$$

$$y = 400$$

$$(20)^2$$

$$\begin{array}{r} 36 \\ 24 \overline{) 10} \end{array}$$

$$36$$

$$24 \overline{) 10}$$

$$36$$

$$40$$

$$= \frac{410 + 400}{2(\sqrt{20^2})}$$

$$= \frac{810}{40} = 20.25$$

$$\begin{array}{r} 20.25 \\ 40 \overline{) 810} \\ \underline{800} \end{array}$$

Prime numbers between 3.166 and 20.25 are.

5, 7, 11, 13, 17, 19

$$\begin{array}{r} 200 \\ 200 \\ \hline \end{array}$$

$$3) \sqrt[3]{10} \text{ \& } \sqrt[3]{999}$$

$$\sqrt[3]{n} = \sqrt[3]{y} + \frac{n-y}{3[\sqrt[3]{y}]^2}$$

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

$$\begin{array}{r} 0.166 \\ n=10 \\ y=8 \\ 12 \overline{) 12} \end{array}$$

$$= \sqrt[3]{2^3} + \frac{2}{3(2)^2} = 2 + \frac{2}{12}$$

$$780$$

$$72$$

$$780$$

$$= 2 + \frac{2}{12} = 2 + 0.166 = 2.166$$

$$+ 72$$

$$8$$

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

$$x = 999$$

$$y = 1000$$

$$\sqrt[3]{999} = \frac{\sqrt[3]{10^3} + 999 - 1000}{3[\sqrt[3]{10^3}]^2}$$

$$= \frac{10 + -1}{3(10)^2} = \frac{10 - 1}{300}$$

$$= 10 - 0.0033$$

$$= 9.9967$$

$$\begin{array}{r} 0.0033 \\ 300 \overline{) 1000} \\ \underline{900} \\ 1000 \end{array}$$

4) The Prime nos between 2.166 and 9.99 are 3, 5, 7

$$4) \sqrt[3]{28} \text{ and } \sqrt{120}$$

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

$$x = 28$$

$$y = 27$$

$$= \frac{3\sqrt[3]{3^3} + 1}{3[3]^2}$$

$$= \frac{3 + 1}{27} = 3 + 0.037$$

$$= 3.037$$

$$\begin{array}{r} 0.037 \\ 27 \overline{) 1000} \\ \underline{81} \\ 190 \\ \underline{162} \\ 280 \\ \underline{270} \\ 10 \end{array}$$

$$\sqrt{120} = \frac{\sqrt{x} + x + y}{2\sqrt{y}}$$

$$= \frac{120 + 121}{2\sqrt{121}} = \frac{241}{2\sqrt{121}}$$

$$u = 120$$

$$y = 121$$

$$= \frac{241}{22} = 10.954$$

Prime numbers between the two are
5, 7.

5) $2\sqrt{8}$ and $\sqrt{400}$.

$$u = 8$$

$$y = 4$$

$$2\sqrt{8} = \frac{u+y}{2\sqrt{y}}$$

$$\Rightarrow \frac{8+4}{2\sqrt{4}} = \frac{12}{2\sqrt{3}} = \left(\frac{12}{2 \times 2} = \frac{4}{4} \right) \times$$

$$\Rightarrow \frac{12}{2\sqrt{3}^2} = \frac{12}{6} = 2.82$$

$$\begin{array}{r} 2.82 \\ 6 \overline{) 17} \\ \underline{12} \\ 50 \\ \underline{48} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

$$\sqrt{400} =$$

$$20^2 = 400$$

$$= \sqrt{20^2}$$

$$= 20$$

Prime no. btw them

3, 5, 7, 11, 13, 17, 19

CSS 2021

a) 1, 8, 27, 64, 125, _____

1, 8, 27, 64, 125, 216

↓ ↓ ↓ ↓
1, 2³, 3³, 4³, 5³, 6³

b) 4, 18, —, 100, 180, 294.

4, 18, 48, 100, 180, 294.

1×4, 2×9, 3×16, 4×25, 5×36, 6×49

↓ ↓ ↓ ↓ ↓
∴ 2², 3², 4², 5², 6², 7²

c) 132, 156, —, 210, 240.

132, 156, 182, 210, 240

24 ? 28 30
+ 26 +
2 2 2

d) 8, 24, 12, 36, 18, 54, _____

8 - 8

54 = 18 × 3

24 - 8 × 3

27 = 54 / 2

12 - ~~24~~ ÷ 2

36 - 12 × 3

18 - ~~36~~ ÷ 2

504

8, 24, 12, 36, 18, 54, 27.

e) 15, 31, 63, 127.

15, 31, 63, 127, ? 235

15, 31, 63, 127, 235

$\times \quad \times \quad \times \quad \times$
 $2 \quad 2 \quad 2 \quad 2$

$= 30+1, 62+1, 126+1, 234+1,$

235 Ans.

CSS 2024

a) 121, 11, 81, 9, , 7

121, 11, 81, 9, 49, 7
 $(11)^2 \quad (9)^2 \quad (7)^2$

b) 100, 50, 25, , 6.25

100, 50, 25, 12.5, 6.25

$\div 2, \div 2, \div 2, = \div 2, 6.25$

c) 4, 9, 64, 125, 1296,

4, 9, 64, 125, 1296, 2401

$(2)^2, (3)^2, (4)^3, (5)^3, (6)^4, (7)^4$

d) 2, 5, 12, 24, 48, —

2, 5, 12, 24, 48, 96.

$\times 2 \times 2 \times 2$

= 96 Ans.

e) 44, 22, 66, 33, 132, —

44, 22, 66, 33, 132, 66

$44 \div 2, 22 \times 3, 66 \div 2, 33 \times 4, 132 \div 2, 66$

$\downarrow$
22

$\downarrow$
66

$\downarrow$
33

$\downarrow$
132

$\downarrow$
66

$\downarrow$
22

66 Ans.

→ complete the pattern

1) BCB, DED, fGf, Hh, _____
232, 454, 676, 898, 101110.

232, 454, 676, 898, 101110.

BCB, DED, fGf, Hh, J, kJ

2) QPO, NML, KJI, _____, EDC
171615, 141312, 11109, _____, 543

171615, 141312, 11109, 876, 543

QPO, NML, KJI, HGf, EDC

3) SCD, TEF, UGH, _____, wkl

1934, 2056, 2178, 22910, 231112.

SCD, TEF, UGH, VIJ, wkl

4) QAR, RAS, SAT, TAU, _____

17118, 18119, 19120, 20121, 21122

QAR, RAS, SAT, TAU, UAV

5) JAK, KBL, LCM, MDN, _____

10111, 11212, 12313, 13414, 14515

JAK, KBL, LCM, MDN, NEO.

6) ELFA, GLHA, ILJA, _____, MLNA.

5 12 6 1, 7 12 8 1, 9 12 10 1, _____, 13 12 14 1

5 12 6 1, 7 12 8 1, 9 12 10 1, 11 12 12 1, 13 12 14 1

ELFA, GLHA, ILJA, KLLA, MLNA.