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GSA- Maths:

Q8 (d)

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

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

formula = $\sqrt{n} = \frac{n+y}{2\sqrt{y}}$

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

$n = 3$

$y = 4$

$= \frac{7}{2\times 2} = \frac{7}{4} = 1.75$

1.75
4 | 7
4
230
28
20
20
xx

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

$n = 120$

$y = 121$

$= \frac{241}{2\sqrt{11^2}} = \frac{241}{22}$

$= 10.954$

10.954
22 | 241
220
210
198
120
110
100
88
12

∴ we had Prime no between 1.75 and 10.95 that includes 2, 3, 5, 7. Ans.

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

$\sqrt[2]{10} = \frac{n+y}{2\sqrt{y}} = \frac{10+9}{2\sqrt{9}}$

$n = 10$

$y = 9$

$= \frac{19}{2\sqrt{3^2}} = \frac{19}{2\times 3} = \frac{19}{6}$

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

$6\overline{)19}\ 3.166$
18
10
6
40
36
40
36
40

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

$x = 410$
$y = 400$.

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

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

$40\overline{)810}\ 20.25$
800
100
80
200
200
$\times$

Prime numbers between 3.166 and 20.25 are.
5, 7, 11, 13, 17, 19.

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

$\sqrt[3]{x} = \sqrt[3]{y} + \frac{x-y}{3[(\sqrt[3]{y})]^2}$

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

$x = 10$
$y = 8$

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

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

$= 2.166$.

$12\overline{)2.000}\ 0.166$
12
80
72
80
72
8

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

$y = 1000$

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

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

$300 \overline{)1000}$ = 0.0033: 900, 1000, 900, 100

$= 10 - 0.0033$

$= 9.99$

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

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

$\sqrt[3]{28} = \sqrt[3]{27} + \frac{28 - 27}{3\left[\sqrt[3]{27}\right]^2}$ $x = 28$, $y = 27$

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

$27 \overline{)1.00}$ = 0.037: 81, 190, 189

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

$= 3.037$

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

$= \frac{120+121}{2\sqrt{121}} = \frac{241}{2\sqrt{11^2}}$ $\quad x = 120$, $y = 121$

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

Prime numbers between the two are 5, 7.

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

$x = 8$, $y = 4$

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

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

$\Rightarrow \frac{17}{2\sqrt{3^2}} = \frac{17}{6} = 2.82$

2.82
6 | 17
12
48
48
18
2

$\sqrt{400} = 20^2 = 400$

$= \sqrt{20}^2.$

$= 20$

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.

$1^3, 2^3, 3^3, 4^3, 5^3, 6^3$

b) 4, 18, ___, 100, 180, 294.

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

$1\times4, 2\times9, 3\times16, 4\times25, 5\times36, 6\times49$

$\therefore 2^2, 3^2, 4^2, 5^2, 6^2, 7^2$

c) 132, 156, ___, 210, 240.

132, 156, 182, 210, 240

24, 26, 28, 30

+2, +2, +2

discuss the logic behind these answers in the form of statements as well.

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

8 - 8

24 - 8×3

12 - 24÷2

36 - 12×3

18 - 36÷2

54 = 18×3

27 = 54/2

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

e) 15, 31, 63, 127.

15, 31, 63, 127, ? 235

15, 31, 63, 127, 235

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

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

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236 Ans.

CSS 2024

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

121, 11, 81, 9, 49, 7

$(11)^2$ $(9)^2$ 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.

×2 ×2 ×2

= 96 Ans.

e) 44, 22, 66, 33, 132, ___

44, 22, 66, 33, 132, 66

44 ÷ 2, 22 × 3, 66 ÷ 2, 33 × 4, 132 ÷ 2, 66.

↓ ↓ ↓ ↓

22 66 33 132

66 Ans.

→ Complete the pattern

1) BCB, DED, fGf, HIH, ___
232, 454, 676, 898, 101110.

232, 454, 676, 898, 101110.
BCB, DED, fGf, HIH, J, kJ

2) QPO, NML, KJI, ___, EDC
171615, 141312, 111009, ___, 543

171615, 141312, 111009, 876, 543
QPO, NML, KJI, HGf, EDC

3) SCD, TEF, UGH, ___, WKL

19 3 4, 20 5 6, 21 7 8, 22 9 10, 23 11 12.
SCD, TEf, UGH, VIJ, WKL

4) QAR, RAS, SAT, TAU, ___

17 1 18, 18 1 19, 19 1 20, 20 1 21, 21 1 22
QAR, RAS, SAT, TAU, UAV

5) JAK, KBL, LCM, MDN, ___
10 1 11, 11 2 12, 12 3 13, 13 4 14, 14 5 15

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, GLITA, ILJA, KLLA, MLNA.

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