45. If $\frac{\sqrt{38-5\sqrt{3}}}{\sqrt{26+7\sqrt{3}}}=\frac{a+b\sqrt{3}}{23}$, $b>0$, *then the value of* $(b-a)$ *is*:

यदि $\frac{\sqrt{38-5\sqrt{3}}}{\sqrt{26+7\sqrt{3}}}=\frac{a+b\sqrt{3}}{23}$, b> 0 हो, तो (b - a) का मान कितना होगा?

[A] 7 [B] 18

[C] 29 [D] 11

18 − (−11)

#

$$\frac{\sqrt{76-2\times5\sqrt{3}\times1}}{\sqrt{5^2+2\times7\times\sqrt{3}}}=\frac{5\sqrt{3}-1}{7+\sqrt{3}}\times\frac{7-\sqrt{3}}{7-\sqrt{3}}$$

$$=\frac{-22+36\sqrt{3}}{46}=\frac{-11+18\sqrt{3}}{23}=\frac{a+b\sqrt{3}}{23}$$

46. If $\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{3+\sqrt{5}}} = a + \sqrt{5}b$, with a, b > 0, then what is the value of (ab):(a+b)?

यदि $\frac{22\sqrt{2}}{4\sqrt{2}-\sqrt{3+\sqrt{5}}} = a + \sqrt{5}b$ है, जहां $a, b > 0$ है, तो (ab):(a+b) का मान क्या होगा?

7:8

[A] 8:7 [B] 4:7

[C] 7:8 [D] 7:4

a=7

b=1

$$\frac{44}{8-\sqrt{6+2\sqrt{5}}\times\sqrt{1}}$$

$$= \frac{44}{8-(\sqrt{5}+1)} = \frac{44}{7-\sqrt{5}} = \frac{44}{7-\sqrt{5}} \times \frac{(7+\sqrt{5})}{44} = 7+\sqrt{5}$$

47. If, $x=5-\sqrt{21}$, then $\frac{\sqrt{x}}{\sqrt{32-2x}-\sqrt{21}}=?$

[A] $\frac{1}{2}(\sqrt{3}-\sqrt{7})$ [B] $\frac{1}{\sqrt{2}}(7+\sqrt{3})$

[C] $\frac{1}{\sqrt{2}}(\sqrt{7}-\sqrt{3})$ [D] $\frac{1}{\sqrt{2}}(\sqrt{7}+\sqrt{3})$

$$= \frac{\sqrt{5-\sqrt{21}}}{\sqrt{22+2\sqrt{21}}-\sqrt{21}}$$

$$= \sqrt{5-\sqrt{21}} = \sqrt{\frac{10-2\sqrt{7}\times\sqrt{3}}{2}} = \frac{\sqrt{7}-\sqrt{3}}{\sqrt{2}}$$

48. If $x = 7 + \sqrt{33}$, then find the value of $\frac{\sqrt{80+8x}+4}{\sqrt{6x}}$?

यदि $x = 7 + \sqrt{33}$, तो $\frac{\sqrt{80+8x}+4}{\sqrt{6x}}$ का मान ज्ञात कीजिये?

[A] $\sqrt{2}$

[B] 1

[C] 2

[D] 4

$2 \times 2 \times 2\sqrt{33}$

$\frac{\sqrt{136+8\sqrt{33}}+4}{\sqrt{4+2+6\sqrt{33}}}$

$2 \times 3 \times \sqrt{33}$

$\frac{6+2\sqrt{33}}{3+\sqrt{33}} = \frac{(2+2\sqrt{33})+4}{3+\sqrt{33}}$

$= 2$

49. $\frac{\sqrt{2}\times\sqrt{26-15\sqrt{3}}}{\sqrt{2}\left[5\sqrt{2}-\sqrt{38+5\sqrt{3}}\right]}=?$

[A] $\sqrt{2}$

[B] $\frac{1}{\sqrt{3}}$

[C] $\sqrt{3}$

[D] $\frac{1}{\sqrt{2}}$

$$\frac{\sqrt{5^2-2\times5\times3\sqrt{3}}}{10-\sqrt{76+2\times5\sqrt{3}\times1}}=\frac{3\sqrt{3}-5}{9-5\sqrt{3}}=\frac{3\sqrt{3}-5}{\sqrt{3}(3\sqrt{3}-5)}$$

$$=\frac{1}{\sqrt{3}}$$

$$=\frac{1}{\sqrt{3}}$$

50. Given that $x = 4\sqrt{12} + 5\sqrt{27} - 3\sqrt{75} + \sqrt{300}$ & $y = \frac{(2+\sqrt{3})}{(2-\sqrt{3})}$. If $\frac{x}{y} = a + b\sqrt{3}$, then what is the value of (a+2b)?

दिया गया है कि $x = 4\sqrt{12} + 5\sqrt{27} - 3\sqrt{75} + \sqrt{300}$ & $y = \frac{(2+\sqrt{3})}{(2-\sqrt{3})}$। यदि $\frac{x}{y} = a + b\sqrt{3}$ है, तो (a+2b) का मान क्या है?

[A] 36 [B] 45
[C] 24 [D] 30

$x = 8\sqrt{3} + 15\sqrt{3} - 15\sqrt{3} + 10\sqrt{3}$

$x = 18\sqrt{3}$

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

$y = 7 + 4\sqrt{3}$

$\frac{18\sqrt{3}}{7+4\sqrt{3}}$

$= 18\sqrt{3} \times \frac{(7-4\sqrt{3})}{1}$

$= -216 + 126\sqrt{3}$

$a = -216$
$b = 126$

$-216 + 252 = 36$

Doeble Rationalisation

51. If $\frac{4}{1+\sqrt{2}+\sqrt{3}} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$, where a, b, c, d are whole numbers, then the value of a + b + c + d.

यदि $\frac{4}{1+\sqrt{2}+\sqrt{3}} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$ a, b, c, d पूर्ण संख्याऐं है तो a + b + c + d का मान ज्ञात कीजिए।

2 1 0 1

[A] 0 [B] 2

[C] 4 [D] 1

$$\frac{4}{(1+\sqrt{2})+\sqrt{3}} \times \frac{1+\sqrt{2}-\sqrt{3}}{(1+\sqrt{2})-\sqrt{3}}$$

$$= \frac{4 \times (1+\sqrt{2}-\sqrt{3})}{2\sqrt{2}} = 1\sqrt{2} + 2 - 1\sqrt{6} = a + b\sqrt{2} + c\sqrt{3} - d\sqrt{6}$$

$+2\sqrt{3}$

- $\sqrt{2} \approx 1.414$
- $\sqrt{3} \approx 1.732$
- $\sqrt{5} \approx 2.24$
- $\sqrt{6} \approx 2.45$
- $\sqrt{10} \approx 3.16$

53. If $(\sqrt{2}+\sqrt{5}-\sqrt{3}) \times k = -12$, then what will be the value of k?

यदि $(\sqrt{2}+\sqrt{5}-\sqrt{3}) \times k = -12$, तो k का मान क्या होगा?

[A] ~~$(\sqrt{2}+\sqrt{5}-\sqrt{3})(2+\sqrt{5})$~~

[B] $(\sqrt{2}+\sqrt{5}+\sqrt{3})(2-\sqrt{5}) \approx 5{\cdot}3 \times -{\cdot}2 \approx -1$

[C] $(\sqrt{2}+\sqrt{5}+\sqrt{3})(2-\sqrt{10}) \approx 5{\cdot}3 \times -1{\cdot}16$

[D] $\sqrt{2}+\sqrt{5}+\sqrt{3}$

(GL MAINS 2018)

approx.

$(1{\cdot}4+2{\cdot}2-1{\cdot}7)$

$1{\cdot}9 \times k = -12$

$k \approx -6$

52. *The value of* $5\sqrt{3} + 7\sqrt{2} - \sqrt{6} - \frac{23}{\sqrt{2}+\sqrt{3}+\sqrt{6}}$ *is:*

$5\sqrt{3} + 7\sqrt{2} - \sqrt{6} - \frac{23}{\sqrt{2}+\sqrt{3}+\sqrt{6}}$ का मान ज्ञात कीजिए।

[A] 15 [B] 16

[C] 12 [D] 10

$8.5 + 9.8 - 2.45 - \frac{23}{5.5}$ (4)

$17.8 - 6$

≈ 12

54. The value of $\frac{2\sqrt{10}}{\sqrt{5}+\sqrt{2}-\sqrt{7}} - \sqrt{\frac{\sqrt{5}-2}{\sqrt{5}+2}} - \frac{3}{\sqrt{7}-2}$ **is:**

$\frac{2\sqrt{10}}{\sqrt{5}+\sqrt{2}-\sqrt{7}} - \sqrt{\frac{\sqrt{5}-2}{\sqrt{5}\oplus 2}} - \frac{3}{\sqrt{7}\ominus 2}$ **का मान क्या है?**

[A] $2\sqrt{5}$

[B] $\sqrt{7}$

[C] $2+\sqrt{2}$

[D] $\sqrt{2}$

$$\frac{2\sqrt{10}\times(\sqrt{5}+\sqrt{2}+\sqrt{7})}{2\sqrt{10}} - \sqrt{\frac{(\sqrt{5}-2)^2}{1}} - \frac{3\times(\sqrt{7}+2)}{3}$$

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

$$= \sqrt{2}$$

55. $(\sqrt{6}+\sqrt{10}-\sqrt{21}-\sqrt{35})(\sqrt{6}-\sqrt{10}+\sqrt{21}-\sqrt{35})=?$

[A] 13

[B] 12

[C] 11

[D] 10

$$\left[(\sqrt{6}-\sqrt{35})+(\sqrt{10}-\sqrt{21})\right]\times\left[(\sqrt{6}-\sqrt{35})-(\sqrt{10}-\sqrt{21})\right]$$

$$=(\sqrt{6}-\sqrt{35})^2-(\sqrt{10}-\sqrt{21})^2$$

$$=(41-2\sqrt{210})-(31-2\sqrt{210})$$

$$=10$$

56. Find the value of $\sqrt{1+2019\sqrt{1+2020\sqrt{1+2021\times 2023}}}$.

[A] 2020

[B] 2021

[C] 2023

[D] 2018

- $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$
  $= a^2 + b^2 + c^2 + 2[ab + bc + ca]$

- $(a - b + c)^2 = a^2 + b^2 + c^2 + 2ab - 2bc - 2ca$
  $= a^2 + b^2 + c^2 + 2[ab - bc - ca]$

- $(a + b - c)^2 = a^2 + b^2 + c^2 - 2ab - 2bc + 2ca$
  $= a^2 + b^2 + c^2 + 2[ca - ab - bc]$

57. If $\sqrt{15+\sqrt{60}+\sqrt{84}+\sqrt{140}} = \sqrt{a}+\sqrt{b}+\sqrt{c}$, then the value of a+b+c?

[A] 5

[B] 20

[C] 10

[D] 15

58. **The expression $\sqrt{10+2(\sqrt{6}-\sqrt{15}-\sqrt{10})}$ is equal to:**

$\sqrt{10+2(\sqrt{6}-\sqrt{15}-\sqrt{10})}$ **का मान है :**

[A] $\sqrt{3}-\sqrt{2}-\sqrt{5}$ **[B]** $\sqrt{3}-\sqrt{2}+\sqrt{5}$

[C] $\sqrt{2}-\sqrt{3}-\sqrt{5}$ **[D]** $\sqrt{3}+\sqrt{2}-\sqrt{5}$

59. If $\sqrt{24+4\sqrt{21}-2\sqrt{35}-4\sqrt{15}}+\sqrt{21+8\sqrt{5}}=\sqrt{a}+\sqrt{b}+\sqrt{c}$, then $a^2+b^2+c^2$=?

[A] 449

[B] 330

[C] 705

[D] 593

60. What is the value of $\sqrt{4600+\sqrt{540+\sqrt{1280+\sqrt{250+\sqrt{36}}}}}$

[A] ~~69~~
[B] 68
[C] ~~70~~
[D] ~~72~~

#

$= \sqrt{4624}$

61. Solve $\sqrt{21+\sqrt[3]{59+\sqrt{16+\sqrt[3]{722+\sqrt{49}}}}}$?

[A] 4

[B] 5

[C] 6

[D] 7

62. Simplify the following?

निम्नलिखित को सरल कीजिये?

$$\frac{\sqrt{10+\sqrt{25+\sqrt{108+\sqrt{154+\sqrt{225}}}}}}{\sqrt{16+19.25\times 16}}$$

[A] 7/18

[B] 1/9

[C] 2/9

[D] 5/18

$$\frac{4}{\sqrt{16\times 20.25}}$$

$$= \frac{4}{4\times 4.5} = \frac{1}{4.5}$$