Simplification

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Important Points

$$(a+b)^2 = a^2 + b^2 + 2ab$$

$$(a-b)^2 = a^2 + b^2 - 2ab$$

$$a^2 - b^2 = (a+b)(a-b)$$

$$\sqrt{a^4 \times b^4 \times c^4} = a^2 b^2 c^2$$

$$\sqrt{a^n \times b^m} = a^{\frac{n}{2}} \times b^{\frac{m}{2}}$$

$$(a+b)^3 = a^3 + 3ab(a+b) + b^3$$

$$(a-b)^3 = a^3 - 3ab(a-b) - b^3$$

$$\frac{\sqrt{x}}{\sqrt{y}} = \sqrt{\frac{x}{y}}$$

$$\sqrt{x} \times \sqrt{y} = \sqrt{xy}$$

$$\sqrt{x\sqrt{x\sqrt{x\ldots n}}} = x^{\frac{2^n-1}{2^n}}$$

$$\sqrt{7\sqrt{7\sqrt{7}}} = 7^{\frac{2^n-1}{2n}} = 7^{\frac{7}{8}}$$

$$\sqrt{x\sqrt{x\sqrt{x\ldots\infty}}} = x$$

$$\sqrt{7\sqrt{7\sqrt{7}\ldots\infty}} = 7$$

$$\sqrt{x-\sqrt{x-\sqrt{x-\ldots\infty}}}$$

$= \sqrt{6-\sqrt{6-\sqrt{6-\ldots}}}$ ⟶ (2)

$3 \times (2)$

$$\sqrt{x+\sqrt{x+\sqrt{x+\ldots\infty}}}$$

$= \sqrt{6+\sqrt{6+\sqrt{6-\ldots}}}$ ⟶ $= (3)$

$(3) \times 2$

1) $p^m \times p^n = p^{m+n}$

2) $(p^m)^n = p^{mn}$

3) $\frac{p^m}{p^n} = p^{m-n}$

4) $\left(\frac{p}{q}\right)^n = \frac{p^n}{p^n}$

$(2^2)^3$ $\quad 2^{2^3}$

$= 2^{2\times 3}$ $\quad 2^{2^3}$

$= 2^6$ $\quad 2^8$

5) $p^0 = 1$

6) $p^{-n} = \frac{1}{p^n}$

7) $p^{\frac{1}{m}} = \sqrt[m]{p}$

8) $\sqrt[m]{p} = p^{\frac{1}{m}}$

9) $\sqrt[m]{pq} = \sqrt[m]{p} \times \sqrt[m]{q}$

10) $\sqrt[m]{\frac{p}{q}} = \frac{\sqrt[m]{p}}{\sqrt[m]{q}}$

11) $\left(\sqrt[m]{p}\right)^{m} = p$

Important Formula

1). $(a+b)^2 = a^2 + 2ab + b^2$

2). $(a-b)^2 = a^2 - 2ab + b^2$

3). $(a^2 - b^2) = (a+b)(a-b)$

4). $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$

5).

$$(a-b)^3 = a^3 - b^3 - 3ab(a-b)$$

6).

$$(a^3 + b^3) = (a+b)(a^2 - ab + b^2)$$

7).

$$(a^3 - b^3) = (a-b)(a^2 + ab + b^2)$$

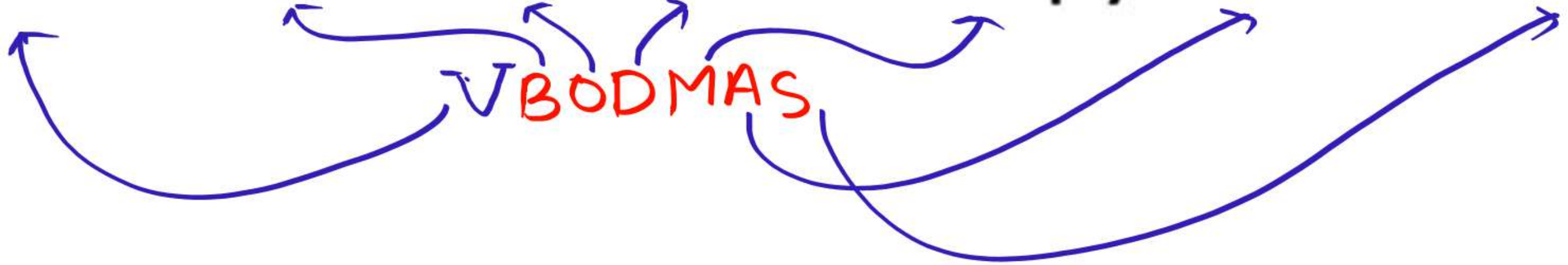
8). $a^3 + b^3 + c^3 - 3abc$

$$9).\ (a+b+c)^2$$

$$= \left(a^2+b^2+c^2\right)+2(ab+bc+ca)$$

VBODMAS Rule:

Vinculum > Brackets > Of > division > multiply > addition > subtraction



1. The value of 2 × 3 ÷ 2 of 3 × 2 ÷ (4 + 4 × 4 ÷ 4 of 4 – 4 ÷ 4 × 4) is

SSC CGL 4 June 2019 (Morning)

$2 \times 3 \div 2$ of $3 \times 2 \div 1$

$= 2 \times 3 \div 6 \times 2 \div 1$

$= 2 \times 3 \times \frac{1}{6} \times 2 \times 1$

$\Rightarrow 2$

$4 + 4 \times 4 \div 16 - 4 \div 4 \times 4$

$= 4 + 4 \times 4 \times \frac{1}{16} - 4 \times 1 \times \frac{1}{4}$

$4 + 1 - 4$

$= 1$

(a) 8
(b) 1
(c) 4
(d) 2

1. The value of $2 \times 3 \div 2$ of $3 \times 2 \div (4 + 4 \times 4 \div 4$ of $4 - 4 \div 4 \times 4)$ is

SSC CGL 4 June 2019 (Morning)

1 × 2 ÷ 1

= ②

(a) 8
(b) 1
(c) 4
(d) 2

2. The value of $2\frac{7}{8} \div \left(3\frac{5}{6} \div \frac{2}{7} \text{ of } 2\frac{1}{3}\right) \times \left[\left(2\frac{6}{7} \text{ of } 4\frac{1}{5} \div \frac{2}{3}\right) \times \frac{5}{9}\right]$ is :

SSC CGL 4 June 2019 (Evening)

(a) $\frac{1}{4}$ (b) 4

(c) $\frac{1}{23}$ (d) 5

Digital sum

4. The simplified value of

$$\left(\frac{1.0025 + 6.25 \times 10^{-6}}{0.0025 + 0.95}\right)$$ **is :**

SSC CGL 9 June 2019 (Evening)

1·0025
0·00000625

$$= \frac{1.00250625}{0.9525}$$

$$\frac{334168\,15}{8\,2\,15} = \frac{1\times4}{7\times4} = \frac{4}{1}$$

8 (a) 1.0025
4 (b) 1.0525
6 (c) 1.0005
2 (d) 1.0505

9. The value of 4.5 – (3.2 ÷ 0.8 × 5) + 3 × 4 ÷ 6 is

SSC CGL 10 June 2019 (Afternoon)

$4.5 - 20 + 2$

(a) – 13.5 (b) 4.2

(c) – 8.5 (d) 5.7

11. The simplified value of

$$\frac{\left(3\frac{1}{5}-\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{7}\div\left\{\frac{6}{7}-\left(\frac{1}{7}\div\frac{1}{5}\right)\right\}}$$ **is :**

SSC CHSL 5 July 2019 (Afternoon)

(a) $\frac{13}{64}$ (b) $\frac{13}{16}$

(c) $\frac{13}{8}$ (d) $\frac{13}{7}$

$$\frac{\frac{13}{8}\times\frac{8}{8}}{\frac{8}{7}\times\frac{7}{1}}$$

$$=\frac{13}{64}$$

Trick

12. $$\frac{5.75 \times 5.75 \times 5.75 + 3.25 \times 3.25 \times 3.25}{57.5 \times 57.5 + 32.5 \times 32.5 - 57.5 \times 32.5}$$ is equal to :

$\frac{9}{100} = 0.09$

SSC CPO 12 March 2019 (Evening)

(a) 0.009
(b) 0.0009
(c) 0.9
(d) 0.09

26. $9\frac{3}{4} \div \left[2\frac{1}{6} \div \left\{4\frac{1}{3} - \left(2\frac{1}{2} + \frac{3}{4}\right)\right\}\right]$ is equal to :

SSC CGL 13 June 2019 (Evening)

(a) $\frac{15}{4}$ (b) 3

(c) $\frac{39}{8}$ (d) 4

36. The value of $\dfrac{\left(3\frac{1}{5}+\frac{3}{5}\right)\div\frac{8}{5}}{1\frac{1}{7}\div\left\{\frac{5}{7}+\left(\frac{1}{7}\div\frac{1}{3}\right)\right\}}$ is

SSC CHSL 8 July 2019 (Morning)

(a) $\frac{19}{8}$

(b) $\frac{19}{16}$

(c) $\frac{19}{64}$

(d) $\frac{19}{7}$

46. **The value of** $\frac{18.43 \times 18.43 - 6.57 \times 6.57}{11.86}$ **is :**

SSC CHSL 11 July 2019 (Morning)

$\frac{a^2-b^2}{a-b} = \frac{(a-b)(a+b)}{(a-b)}$

$= a+b$

(a) 23.62 **(b) 25**

(c) 26 **(d) 24.12**

53. $$\frac{63.5 \times 63.5 \times 63.5 + 36.5 \times 36.5 \times 36.5}{6.35 \times 6.35 + 3.65 \times 3.65 - 6.35 \times 3.65}$$ is :

10000

SSC CPO 13 March 2019 (Evening)

(a) 10,000
(b) 1,00,000
(c) 100
(d) 1,000

56. $\dfrac{675 \times 675 \times 675 + 325 \times 325 \times 325}{67.5 \times 67.5 + 32.5 \times 32.5 - 67.5 \times 32.5}$ is equal to :

1000 X 100

SSC CPO 12 March 2019 (Morning)

(a) 100
(b) 10,000
(c) 1,000
(d) 1,00,000

82. If A = 40 ÷ 8 + 5 × 2 – 4 × 5 of 3 and B = 24 ÷ 4(4 + 2) + 19 of 2, then what is the value of A – B?

SSC MTS 5 August 2019 (Morning)

(a) –11 **(b) 11**

(c) 13 **(d) – 13**

100. Find the value

$$\left(\frac{1}{2}\div\frac{1}{2}\times\frac{1}{2}+\frac{1}{2}-\frac{1}{2}+\frac{1}{2}\times\frac{1}{2}\div\frac{1}{2}\right)$$ **of**

$$\left(\frac{1}{2}+\frac{1}{2}\right)$$**?**

SSC MTS 8 August 2019 (Morning)

(a) $\frac{3}{2}$ **(b)** $\frac{1}{2}$

(c) 1 **(d)** $\frac{5}{2}$

Basic

105. The value of $99\frac{95}{99} \times 99 - 95$ is :

SSC MTS 9 August 2019 (Morning)

(a) 9897 **(b) 9993**

(c) 9999 **(d) 9801** ✓

$99\frac{95}{99} \times 99 - 95$

$= \left(99 + \frac{95}{99}\right) \times 99 - 95$

$= 99 \times 99 + \frac{95 \times 99}{99} - 95$

$= 99 \times 99 + 95 - 95$

9801

Smart

105. The value of $99\frac{95}{99} \times 99 - 95$ is :

SSC MTS 9 August 2019 (Morning)

$99\frac{95}{99} \times 99$

$= 9801 + 95 - 95$

(a) 9897 **(b) 9993**

(c) 9999 **(d) 9801**

$\equiv 999\frac{50}{999} \times 999 - 25$

$998001 + 50 - 25 = 998026$

140. Approximate value of

(4488 ÷ 11.01 – 7.98) ÷ 15.99 is :

SSC MTS 21 August 2019 (Afternoon)

(a) 2.5
(b) 26
(c) 25
(d) 2.6

408
(~~4488~~ 88 ÷ ~~11~~ – 8) ÷ 16

$= \frac{400}{16}$

25

$x = \frac{1}{1}\left[\frac{1}{12} - \frac{1}{24}\right]$

$x = \frac{1}{24}$

$Y = \frac{1}{1}\left[\frac{1}{36} - \frac{1}{72}\right] = \frac{1}{72}$

$\frac{x}{y} = \frac{1/24}{1/72} = \frac{72}{24} = 3$

149. If $x = \frac{1}{12.13} + \frac{1}{13.14} + \frac{1}{14.15} \ldots\ldots + \frac{1}{23.24}$,

$y = \frac{1}{36.37} + \frac{1}{37.38} + \frac{1}{38.39} \ldots\ldots + \frac{1}{71.72}$

then $\frac{x}{y}$ is equal to :

SSC CHSL 10 July 2019 (Evening)

(a) $\frac{1}{3}$ (b) $\frac{1}{24}$

(c) $\frac{1}{72}$ (d) 3 ✓

152. The value of $22.\overline{4} + 11.\overline{67} - 33.5\overline{9}$ is :

SSC CGL Tier-II (11 September 2019)

(a) $0.\overline{32}$ ✗

(b) $0.\overline{412}$ ✗

(c) $0.3\overline{1}$ ✗

(d) $0.4\overline{12}$ ✓

Smart

① हमें जितनी संख्या पे Bar है उसका LCM लेना होगा

LCM (1, 2, 1) = 2

② after decimal there is on no. which doesn't have bar.

154. The value of

$$\frac{(253)^3 + (247)^3}{25.3 \times 25.3 - 624.91 + 24.7 \times 24.7}$$

is 50×10^k, where the value of k is :

SSC CGL Tier-II (11 September 2019)

(a) 3 (b) 4

(c) 2 (d) – 3

$50000 = 50 \times 10^k$

$50 \times 10^3 = 50 \times 10^k$

$k = 3$

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

SSC CGL Tier-II (11 September 2019)

(a) $\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)$

(b) $\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)\left(2-\sqrt{10}\right)$

(c) $\left(\sqrt{2}+\sqrt{5}-\sqrt{3}\right)\left(2+\sqrt{5}\right)$

(d) $\left(\sqrt{2}+\sqrt{5}+\sqrt{3}\right)\left(2-\sqrt{5}\right)$

$$k = \frac{-12}{(\sqrt{2}+\sqrt{5}-\sqrt{3})} \times \frac{(\sqrt{2}+\sqrt{5}+\sqrt{3}}{(\sqrt{2}+\sqrt{5}+\sqrt{3}}$$

$$\frac{-12(\sqrt{2}+\sqrt{5}+\sqrt{3}}{2+\sqrt{10}+\sqrt{6}+\sqrt{10}+5+\sqrt{15}-\sqrt{6}-\sqrt{15}-3}$$

$$= \frac{-12(\sqrt{2}+\sqrt{5}+\sqrt{3}}{4+2\sqrt{10}}$$

$$= \frac{-6(\sqrt{2}+\sqrt{5}+\sqrt{3}}{(2\times\sqrt{10})} \times \frac{2-\sqrt{10}}{2-\sqrt{10}}$$

$$= \frac{-6(\sqrt{2}+\sqrt{5}+\sqrt{3}\,(2-\sqrt{10})}{-6}$$

156. The vale of $\left(1\frac{1}{3} \div 2\frac{6}{7} \text{ of } 5\frac{3}{5}\right) \div$

$\left(6\frac{2}{5} \div 4\frac{1}{2} \text{ of } 5\frac{1}{3}\right) \times \left(\frac{3}{4} \times 2\frac{2}{3} \div \frac{5}{9} \text{ of } 1\frac{1}{5}\right)$

= 1 + k, where k lies between :

SSC CGL Tier-II (12 September 2019)

(a) – 0.07 and – 0.06

(b) – 0.08 and – 0.07

(c) – 0.06 and – 0.05

(d) – 0.05 and – 0.04

158. The expression

$$\sqrt{10+2\left(\sqrt{6}-\sqrt{15}-\sqrt{10}\right)}$$

SSC CGL Tier-II (12 September 2019)

(a) $\sqrt{3}+\sqrt{2}-\sqrt{5}$ **(b)** $\sqrt{3}-\sqrt{2}-\sqrt{5}$

(c) $\sqrt{3}-\sqrt{2}+\sqrt{5}$ **(d)** $\sqrt{2}-\sqrt{3}-\sqrt{5}$

159. The value of $0.5\overline{6} - 0.7\overline{23} + 0.3\overline{9} \times 0.\overline{7}$ is :

SSC CGL Tier-II (12 September 2019)

(a) $0.1\overline{54}$ (b) $0.\overline{154}$

(c) $0.\overline{158}$ (d) $0.1\overline{58}$

163. 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 :**

SSC CGL Tier-II (13 September 2019)

(a) $2+\sqrt{2}$ **(b)** $2\sqrt{5}$

(c) $\sqrt{2}$ **(d)** $\sqrt{7}$

166. The value of

$$\frac{(4.6)^4 + (5.4)^4 + (24.84)^2}{(4.6)^2 + (5.4)^2 + 24.84}$$ **is :**

SSC CGL Tier-II (13 September 2019)

(a) 24.42 **(b) 24.24**

(c) 25.42 **(d) 25.48**

167. If '+' means '–', '–' means '+', '×' means '÷' and '÷' means '×', then the value of $\frac{42-12\times3+8\div2+15}{8\times2-4+9\div3}$ is :

SSC CGL 3 March 2020 (Morning)

(a) $-\frac{5}{3}$ **(b) $-\frac{15}{19}$**

(c) $\frac{15}{19}$ **(d) $\frac{5}{3}$**

195. If '+' means '÷', '×' means '+', '÷' means '–' and '–' means '×', then what will be the value of the following expreswsion?

18 + 3 – 5 × 6 ÷ 4

CHSL 14/10/2020 (Morning)

(a) 30 **(b) 32**

(c) 15.5 **(d) 13.5**

197. The value of

$$5\sqrt{3} + 7\sqrt{2} - \sqrt{6} - \frac{23}{\sqrt{2} + \sqrt{3} + \sqrt{6}}$$ **is :**

CHSL 14/10/2020 (Afternoon)

(a) 0 **(b) 16**

(c) 12 **(d) 10**

201. Find the value of $225 - [42 - \{25 - \overline{(18 - 18 + 13)}\}]$.

CHSL 15/10/2020 (Evening)

(a) 222 **(b) 231**

(c) 223 **(d) 244**

218. If $\left[\left\{\left(\frac{2}{3}\right)^{3}\right\}^{(2x+3)}\right]^{-\frac{3}{4}} = \left[\left\{\left(\frac{2}{3}\right)^{\frac{2}{3}}\right\}^{(3x+7)}\right]^{-\frac{6}{5}}$,

then the value of $\sqrt{2-42x}$ is :

CHSL 18/03/2020 (Morning)

(a) 5 (b) 6

(c) 3 (d) 4

219. If $\frac{4}{1+\sqrt{2}+\sqrt{3}} = a + b\sqrt{2} + x\sqrt{3} - d\sqrt{6}$, where a, b, c, d are natural number, then the value of a + b + c + d is :

CHSL 18/03/2020 (Morning)

(a) 0 (b) 2

(c) 4 (d) 1

223. The value of $\left(2.\overline{4} \times 0.\overline{6} \times 3 \times 0.1\overline{6}\right)$ $\times \left[0.\overline{27} \times \left(0.8\overline{3} \times 0.1\overline{6}\right)\right]$ is :

CGL Mains Tier-II (15/10/2020)

(a) $0.\overline{814}$ **(b)** $0.\overline{11}$

(c) $1.\overline{1}$ **(d)** $1.\overline{36}$

224. If $\frac{1}{4-\sqrt{8}}+\frac{3+2\sqrt{2}}{3-2\sqrt{2}}-\frac{3-2\sqrt{2}}{3+2\sqrt{2}}=a+b\sqrt{2}$, then what is the value of (3a + 4b)?

CGL Mains Tier-II (15/10/2020)

(a) $99\frac{1}{2}$

(b) 97

(c) $98\frac{1}{3}$

(d) 98

226. Let $x = \left(\frac{\sqrt{1875}}{\sqrt{3888}} \div \frac{\sqrt{1200}}{\sqrt{768}}\right) \times \frac{\sqrt{175}}{\sqrt{1792}}$, then $\sqrt{x}$ is equal to :

CGL Mains Tier-II (15/10/2020)

(a) $\frac{7}{12}$

(b) $\frac{4}{9}$

(c) $\frac{5}{12}$

(d) $\frac{5}{9}$

227. The expression

$$\frac{15\left(\sqrt{10}+\sqrt{5}\right)}{\sqrt{10}+\sqrt{20}+\sqrt{40}-\sqrt{5}-\sqrt{80}}$$

is equal to :

CGL Mains Tier-II (15/10/2020)

(a) $5+2\sqrt{2}$ **(b)** $5-2\sqrt{2}$

(c) $5\left(3+2\sqrt{2}\right)$ **(d)** $10\left(3+2\sqrt{5}\right)$

229. The value of $\dfrac{0.0203 \times 2.92}{0.7 \times 0.0365 \times 2.9} \div \dfrac{(12.12)^2 - (8.12)^2}{(0.25)^2 + (0.25)(19.99)}$ **is :**

CGL Mains Tier-II (15/10/2020)

(a) 0.05
(b) 0.5
(c) 0.1
(d) 0.01

231. If $\sqrt{11-3\sqrt{8}} = a + b\sqrt{2}$, then what is the value of $(2a + 3b)$?

CGL 2019 Tier-II (16/11/2020)

(a) 5
(b) 7
(c) 9
(d) 3

234. The value of $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}}$ lies between :

CGL 2019 Tier-II (16/11/2020)

(a) 2 and 2.5 (b) 3 and 3.5

(c) 1.5 and 2 (d) 2.5 and 3

236. If $x = \sqrt{-\sqrt{3}+\sqrt{3+8\sqrt{7+4\sqrt{3}}}}$ where $x > 0$, then the value of x is equal to :

CGL 2019 Tier-II (18/11/2020)

(a) 2 (b) 3

(c) 4 (d) 1

237. The value of $5 - \frac{8+2\sqrt{15}}{4} - \frac{1}{8+2\sqrt{15}}$ is equal to :

CGL 2019 Tier-II (18/11/2020)

(a) $\frac{2}{3}$ (b) 1

(c) $\frac{1}{2}$ (d) $\frac{1}{4}$

250. The value of $7 \div [5 + 1 \div 2 - \{4 + (4 \text{ of } 2 \div 4) + (5 \div 5 \text{ of } 2)\}]$ is :

CPO 23/11/2020 (Morning)

(a) 7

(b) $\frac{7}{2}$

(c) $-\frac{7}{2}$

(d) -7