

ALGEBRA BASED SIMPLIFICATION FORMULAS



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

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

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

- $(a + b)^2 - (a - b)^2 = 4ab$ ✓

- $(a + b)^2 = (a - b)^2 + 4ab$

- $(a - b)^2 = (a + b)^2 - 4ab$

88. Simplify: $\frac{(379+276)^2+(379-276)^2}{379 \times 379+276 \times 276}$

निम्नलिखित को सरल कीजिए।

$$\frac{(379+276)^2+(379-276)^2}{379 \times 379+276 \times 276}$$

^a ^b
SSC CHSL 2023 PRE

[A] 2 ✓

[C] 103

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

[B] 655

[D] 1



89. The value of $\frac{10^{-2} [(68.4)^2 + (31.6)^2]}{[(684+316)^2 + (684-316)^2]}$ is:

[A] 0.05

[C] 0.0005

$$= 10^{-2} \times .5$$

$$= .005$$

[B] 0.005

[D] 0.5

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

$$b^{-1}$$



90. *Simplify the given expression*
दिये गए व्यंजक का सरलीकरण करें।

$$\frac{(326+222)^2 - (326-222)^2}{(652 \times 37)}$$

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[A] 16

[C] 3

$$= \frac{4 \times 326 \times 222^6}{652 \times 37}$$
$$= 12$$

[B] 4

[D] 12

91. The value of $\frac{4.669 \times 4.669 - 9 \times (0.777)^2}{(4.669)^2 + (2.331)^2 + 14(0.667)(2.331)}$ is $(1 - k)$, where $k = ?$

$$\frac{4.669 \times 4.669 - 9 \times (0.777)^2}{(4.669)^2 + (2.331)^2 + 14(0.667)(2.331)}$$

का मान $(1-k)$ है, जिसमें $k = ?$

[A] 0.467

2×4.669

[B] 0.768

[C] 0.647

[D] 0.666

$$4.669 \rightarrow a$$

$$2.331 \rightarrow b$$

$$\frac{a^2 - b^2}{a^2 + b^2 + 2ab} = \frac{(a-b) \cdot (a+b)}{(a+b)^2} = \frac{a-b}{a+b} = \frac{2.338}{7}$$

$$.334 = 1 - k$$

$$k = 1 - .334 = .666$$



92.

The value of $\frac{0.325 \times 0.325 + 0.175 \times 0.175 + 25 \times 0.00455}{5 \times 0.0065 \times 3.25 - 7 \times 0.175 \times 0.025} + \frac{0.5}{1.5}$ is:

$$\frac{.325 \times .325 + .175 \times .175 + 25 \times .455}{5 \times .0065 \times 3.25 - 7 \times .175 \times .025} + \frac{0.5}{1.5}$$

का मान ज्ञात करें।

- [A] 3
- [C] $\frac{7}{3}$

- [B] 2
- [D] $\frac{11}{3}$

325 → a
175 → b

$$\frac{a^2 + b^2 + 2ab}{a^2 - b^2}$$

$$= \frac{a+b}{a-b} = \frac{1500}{50} = 30$$

$$= \frac{10}{3} + \frac{1}{3} = \frac{11}{3}$$



ALGEBRA BASED SIMPLIFICATION FORMULAS



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

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

#

93. Simplify the following expression: / निम्नलिखित व्यंजक को सरल बनाएं:

$$\underline{.1 \times .1} + \underline{0.68 \times 0.68} + \underline{0.22 \times 0.22} + 0.044 + 0.136 + 0.44 \times 0.68$$

[A] 0.69

[B] 1

[C] 0.9

[D] 0.8

$$= (.1 + .68 + .22)^2$$
$$= 1^2$$



ALGEBRA BASED SIMPLIFICATION FORMULAS



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

- $a^3 + b^3 = (a + b)^3 - 3ab(a + b)$
 $= (a + b) \cdot [(a + b)^2 - 3ab]$
 $a^3 + b^3 = (a + b) \cdot [a^2 + b^2 - ab]$

- $\frac{a^3 + b^3}{a + b} = a^2 + b^2 - ab$ ✓

- $\frac{a^3 + b^3}{a^2 + b^2 - ab} = a + b$ ✓

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

- $a^3 - b^3 = (a - b)^3 + 3ab(a - b)$
 $= (a - b) \cdot [(a - b)^2 + 3ab]$ ✓
 $a^3 - b^3 = (a - b) \cdot [a^2 + b^2 + ab]$

- $\frac{a^3 - b^3}{a - b} = a^2 + b^2 + ab$ ✓

- $\frac{a^3 - b^3}{a^2 + b^2 + ab} = a - b$ ✓

94. Find the value of: $0.78^3 + 0.22^3 + 3(0.78)(0.22) + 1$.

$0.78^3 + 0.22^3 + 3(0.78)(0.22) + 1$ का मान ज्ञात कीजिए।

[A] 8

[B] 4

[C] 1

[D] 2

$$0.78^3 + 0.22^3 + 3(0.78)(0.22) + 1$$

$$= 1 + 1$$



95. Simplify the following expression.

$$32^3 - 3(32^2)(12) + 3(32)(12^2) - 12^3$$

[A] 8000

[B] 4000

[C] 16000

[D] 800

$$= (32 - 12)^3$$



96. If $p = (0.001) + 3(0.1)(0.99) + (0.3)(98.01) + (9.9)(98.01)$, then find the value of $\frac{p}{25}$.
यदि $P = (0.001) + 3(0.1)(0.99) + (0.3)(98.01) + (9.9)(98.01)$ है, तो $\frac{p}{25}$ का मान ज्ञात कीजिए।

[A] 400

[B] 540

[C] 50

[D] 40

$$= \frac{1000}{25}$$

$$(.1)^3 + 3 \times (.1)^2 \times 9.9 + 3 \times .1 \times 9.9^2 + 9.9^3$$

$$P = (.1 + 9.9)^3$$



97. Find the value of p so that the expression $(15.97)^3 + 1.4373 \times p + (0.03)^3$ is a perfect cube.

p का वह मान ज्ञात कीजिए जिससे व्यंजक $(15.97)^3 + 1.4373 \times p + (0.03)^3$ एक पूर्ण घन हो जाए।

[A] ~~0.000027~~

[B] 4096

[C] 16 ✓

[D] 47.91

$$3 \times 15.97 \times 0.03 \times 16$$



98. Simplify the following expression $\frac{(8.25)^3 - 3 \times (8.25)^2 \times 0.25 + 24.75 \times (0.25)^2 - (0.25)^3}{4 \times 4 \times 4}$?

निम्नलिखित अभिव्यक्ति को सरल बनाएं $\frac{(8.25)^3 - 3 \times (8.25)^2 \times 0.25 + 24.75 \times (0.25)^2 - (0.25)^3}{4 \times 4 \times 4}$?

[SSC SELECTION POST (PHASE XII) 2024]

[A] 8 ✓

[C] 4

[B] 6

[D] 2

$$\frac{8^3}{4^3} = 8$$

$$(8.25 - 0.25)^3$$



99. The value of $\frac{\{18^3 + 36(18)^2 + 54(12)^2 + 12^3\}^{\frac{2}{3}}}{\sqrt[3]{3375} + \sqrt[3]{4096} + \sqrt[3]{2744}}$ is

$\frac{\{18^3 + 36(18)^2 + 54(12)^2 + 12^3\}^{\frac{2}{3}}}{\sqrt[3]{3375} + \sqrt[3]{4096} + \sqrt[3]{2744}}$ का मान ज्ञात कीजिए।

(IB ACIO GRADE-2 2025)

[A] 20

[B] 15

[C] 31

[D] 28

$$(B+A)^3$$

$$(a^m)^n = a^{m \times n}$$

$$\frac{300}{15+16+14}$$

$$= \frac{900}{45} = 20$$



100. Solve
$$\frac{(2.45)^3 + 7.35(1.55)^2 - 4.65(2.45)^2 - (1.55)^3}{(2.45)^2 - 2 \times 2.45 \times 1.55 + (1.55)^2}$$

[A] 0.8

[C] 0.7

✓ [B] 0.9

[D] 0.6

$$\frac{(a-b)^3}{(a-b)^2} = a-b = 2.45-1.55 = 0.9$$



101. $\{(3.07)^3 - (0.07)^3 - 0.63 \times 3.07\} \div \{(1.98)^3 + (0.02)^3 + 1.98 \times 0.12\} = ?$

[A] 3.6

[B] 2.25

[C] 3.125

[D] 3.375

$= 3^3 \div 2^3 = 1.5^3$

$3.07^3 - .07^3 - 3 \times 3.07 \times .07 \times 3$

102. $\frac{(5.4)^2 + (4.4)^2 - 47.52}{(5.4)^3 - (4.4)^3 - 71.28} = ?$

[A] 0.21

[C] 12.60

[B] 1

[D] -1

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

103. *What is the value of $(.91)^3 + (.09)^3 / [(.91)^2 - .0819 + (.09)^2]$?*
 $(.91)^3 + (.09)^3 / [(.91)^2 - .0819 + (.09)^2]$ का मान क्या है?

SSC CHSL TIER – I 2022

[A] 1 ✓

[C] 4

[B] 5

[D] 6

$$= .91 + .09$$
$$= 1$$



$$\frac{a^3 + b^3}{a^2 - ab + b^2} = a + b$$

$$\frac{a^3 - b^3}{a^2 + ab + b^2} = a - b$$

104. Simplify the following/निम्नलिखित को सरल कीजिए।

$$\frac{762 \times 762 \times 762 + 316 \times 316 \times 316}{762 \times 762 - 762 \times 316 + 316 \times 316}$$


(SSC CGL 2022)

[A] 1064

[B] 1056

[C] 1042

[D] 1078

$762 \rightarrow a = 762 + 316$ 

$316 \rightarrow b$



105. The value of $\frac{427 \times 427 \times 427 + 325 \times 325 \times 325}{42.7 \times 42.7 + 32.5 \times 32.5 - 42.7 \times 32.5}$ is:

$$\frac{427 \times 427 \times 427 + 325 \times 325 \times 325}{42.7 \times 42.7 + 32.5 \times 32.5 - 42.7 \times 32.5}$$

का मान ज्ञात करो?

[A] 75.2

[B] 752

[C] 75200

[D] 7520

$$= (427 + 325) \times 100$$



106.

$$\frac{63.5 \times 63.5 \times 63.5 + 36.5 \times 36.5 \times 36.5}{6.35 \times 6.35 + 3.65 \times 3.65 - 6.35 \times 3.65}$$

is equal to:

[A] 10,000

[B] 1,00,000

[C] 100

[D] 1,000

$$= 10 \times (635 + 365)$$



107. The value of $\frac{(0.013)^3 + (0.007)(0.000049)}{(0.007)^2 + 0.013(0.013 - 0.007)}$ is

$\frac{(0.013)^3 + (0.007)(0.000049)}{(0.007)^2 + 0.013(0.013 - 0.007)}$ का मान ज्ञात कीजिए।

SSC CGL 2023 PRE

[A] 0.06

[C] 0.07

$(.007)^3$

✓ [B] 0.02

[D] 0.04

$= .013 + .007$



108. *Evaluate the following:*

निम्नलिखित का मूल्यांकन करें:

$$\frac{((12.5)^3 + (7.5)^3)}{(12.5)^2 + (7.5)^2 - 12.5 \times 7.5}$$

[A] 20

[C] 30

$$= 12.5 + 7.5$$

[B] 25

[D] 15



109. The value of $\frac{27 \times (0.25)^3 + 125(0.05)^3}{(0.75)^2 - 0.25 \times 0.5}$ is:

$\frac{27 \times (0.25)^3 + 125(0.05)^3}{(0.75)^2 - 0.25 \times 0.5}$ का मान ज्ञात कीजिए।

[A] 1 ✓

[C] 0.75

[B] 0.25

[D] 0.5

$$\frac{.75^3 + .25^3}{.75^2 - .25 \times (.75 - .25)} = .75 + .25$$



110. $\frac{8 \times (3.75)^3 + 1}{(7.5)^2 - 6.5} = ?$

[A] 2.75

[C] 4.75

[B] $\frac{9}{5}$

[D] 8.5

$$\frac{7.5^3 + 1^3}{7.5^2 - 7.5 + 1^2} = 7.5 + 1$$



111.

The square root of $\sqrt{\frac{(0.75)^3}{1-0.75} + [0.75 + (0.75)^2 + 1]^2}$

[A] 1

[B] 2

[C] 3

[D] 4

$$= \sqrt{\frac{\cancel{.75^3} + 1^3 - \cancel{.75^3}}{1-.75}}$$

$$= \sqrt{\frac{100}{25}} = \sqrt{4}$$



112. The value of $\frac{146 \times 146 \times 146 - 143 \times 143 \times 143}{146 \times 146 + 143 \times 143 + 146 \times 143}$ is:

$\frac{146 \times 146 \times 146 - 143 \times 143 \times 143}{146 \times 146 + 143 \times 143 + 146 \times 143}$ का मान क्या होगा।

(SSC CGL 2022)

[A] 0

[B] 3

[C] 289

(D) 1

$$\begin{aligned} &= 146 - 143 \\ &= 3 \end{aligned}$$



113. Simplify $\frac{6.1 \times 6.1 \times 6.1 - 1}{6.1 \times 6.1 + 6.1 + 1}$?
सरल बनाएं $\frac{6.1 \times 6.1 \times 6.1 - 1}{6.1 \times 6.1 + 6.1 + 1}$?

(DP CONSTABLE 2023)

[A] 4.1

[C] 6.1

$$= 6.1 - 1$$

[B] 3.1

✓ [D] 5.1



114. *Simplify the given expression.* / दिए गए व्यंजक को सरल कीजिए।

$$\frac{(4.2)^3 - 0.008}{(4.2)^2 + 0.84 + 0.04}$$

SSC CHSL 2023 PRE

[A] 4

[C] -2

[B] 2

[D] -4

$$\frac{4 \cdot 2^3 - 2^3}{4 \cdot 2^2 + 0.84 + 2^2}$$



115. *Simplify the given expression.*

निम्नलिखित व्यंजक का मान क्या होगा?

$$\frac{(3.254 \times 3.254 \times 3.254) - (0.746 \times 0.746 \times 0.746)}{(3.254 \times 3.254) + (0.746 \times 0.746) + (3.254 \times 0.746)}$$

(SSC CPO 2023)

✓ [A] 2.508

[C] 2.146

[B] 4.508

[D] 3.156

$= 3.254 - 0.746$



116. The value of $\frac{(157 \times 157) + (157 \times 133) + (133 \times 133)}{(157 \times 157 \times 157) - (133 \times 133 \times 133)}$ is:

$\frac{(157 \times 157) + (157 \times 133) + (133 \times 133)}{(157 \times 157 \times 157) - (133 \times 133 \times 133)}$ का मान क्या होगा?

(SSC CPO 2023)

[A] 24

[B] 1/290

[C] 290

✓ [D] 1/24

$$\frac{a^2 + ab + b^2}{a^3 - b^3} = \frac{1}{a-b} = \frac{1}{157-133}$$



117. If $\frac{(17)^3 + (7)^3}{(17^2 + 7^2 - k)} = 24$, then what is the value of k ?

यदि $\frac{(17)^3 + (7)^3}{(17^2 + 7^2 - k)} = 24$ है, तो k का मान क्या है?

[A] 119

[C] 24

\downarrow
~~17x7~~

[B] 128

[D] 109



118. *Simplify the given expression.* / दिए गए व्यंजक को सरल कीजिए।

$$\frac{4913+343}{289+49-119}$$

SSC CHSL 2023 PRE

[A] 20

[C] 22

[B] 24

[D] 26

$$\frac{17^3 + 7^3}{17^2 + 7^2 - 119}$$



119. Find the value of the following expression:

निम्नलिखित व्यंजक का मान ज्ञात कीजिए:

$$\frac{(7.03)^3 - 0.027}{(7.03)^2 + \underline{2.109} + (0.3)^2}$$

[A] 7.06

[C] 7.33

[B] 7

[D] 6.73

$$= 7.03 - 0.3$$

$$= 6.73$$

