

ALGEBRA BASED SIMPLIFICATION FORMULAS

$$\begin{aligned}(a + b)^3 &= a^3 + b^3 + 3a^2b + 3ab^2 \\ &= a^3 + b^3 + 3ab(a + b)\end{aligned}$$

$$\begin{aligned}(a - b)^3 &= a^3 - b^3 - 3a^2b + 3ab^2 \\ &= a^3 - b^3 - 3ab(a - b)\end{aligned}$$

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113. 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

$$(8.25 - 0.25)^3$$

$$\frac{8^3}{4^3} = 2^3$$

114. **Simplify :**
$$\frac{(4.23)^3 - 0.69 \times (4.23)^2 + 12.69(0.23)^2 - (0.23)^3}{0.4 \times 0.4 \times 0.4}$$

सरल करें:
$$\frac{(4.23)^3 - 0.69 \times (4.23)^2 + 12.69(0.23)^2 - (0.23)^3}{0.4 \times 0.4 \times 0.4}$$

(RRB NTPC GRADUATE LEVEL CBT – 1 2025)

☒ [A] 1000

[B] 10

[C] 100

[D] 1

$$(4.23 - 0.23)^3$$

$$\frac{4^3}{.4^3} = \left(\frac{40}{4} \right)^3 = 10^3$$

115. 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

[C] 31

[B] 15

[D] 28

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

$$\frac{(18+12)}{15+16+14} = \frac{30}{45} = 20$$

116. 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

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

$$= 2.45 - 1.55$$

$$= 0.90$$

117. $\{(\overset{a}{3.07})^3 - (\overset{b}{0.07})^3 - \underline{0.63 \times 3.07}\} \div \{(1.98)^3 + (0.02)^3 + 1.98 \times 0.12\} = ?$

[A] 3.6

[B] 2.25

[C] 3.125

[D] 3.375

$$(3.07)^3 - (0.07)^3 - \underbrace{3 \times 3.07 \times 0.07}_{\text{X}}$$

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

$$27 \div 8 = 3\frac{3}{8}$$

$$\begin{aligned} & (3.07 - 0.07)^3 \\ & (1.98 + 0.02)^3 \end{aligned}$$

ALGEBRA BASED SIMPLIFICATION FORMULAS

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

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

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

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

lllll

118. Simplify: $\frac{(0.45)^3 + (0.2)^3}{(0.45)^2 - 0.45 \times (0.2) + (0.2)^2}$

सरल करें: $\frac{(0.45)^3 + (0.2)^3}{(0.45)^2 - 0.45 \times (0.2) + (0.2)^2}$

(RRB GROUP D 2024)

[A] $\frac{13}{20}$

[C] $\frac{65}{10}$

$= .45 + .2$

$= .65$

$= \frac{65}{100}$

[B] $\frac{1}{4}$

[D] $\frac{43}{100}$

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

119. **Simplify :** $\frac{(525 \times 525 \times 525) + (321 \times 321 \times 321)}{525 \times 525 - 525 \times 321 + 321 \times 321} \times \frac{1}{96 - 36}$

सरल करें: $\frac{(525 \times 525 \times 525) + (321 \times 321 \times 321)}{525 \times 525 - 525 \times 321 + 321 \times 321} \times \frac{1}{96 - 36}$

(RRB NTPC GRADUATE LEVEL CBT – 1 2025)

[A] 12.5

[B] 15.9

[C] 13.1

[D] 14.1

$$(525 + 321) \times \frac{1}{60}$$

a → 525

b → 321

$$\begin{array}{r} 14.1 \\ \times 60 \\ \hline 846 \\ \hline \end{array}$$

120. 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

$100 \times (427 + 325)$

121. **Simplify :** $\frac{732 \times 732 \times 732 + 268 \times 268 \times 268}{73.2 \times 73.2 + 26.8 \times 26.8 - 73.2 \times 26.8}$

सरल करें: $\frac{732 \times 732 \times 732 + 268 \times 268 \times 268}{73.2 \times 73.2 + 26.8 \times 26.8 - 73.2 \times 26.8}$

(RRB NTPC GRADUATE LEVEL CBT – 1 2025)

[A] 100

[B] 10000

✓ [C] 100000

[D] 1000

100×1000

122. 10^X

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

is equal to:

[A] 10,000

[B] 1,00,000

[C] 100

[D] 1,000

③
④

$$10^X(635+365)$$

123. 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

[B] 25

[D] 15

$= 12.5 + 7.5$

124. 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

[B] 0.25

[C] 0.75

[D] 0.5

$$\frac{3^3 \times .25^3}{.75^3}$$

$$\frac{.75^3 + .25^3}{.75^2 - .25 \times (.75 - .25)} \\ = .75 + .25 = 1$$

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

[A] 2.75

[C] 4.75

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

✓ [D] 8.5

$$2 \times 3.75^3$$

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

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

$\sqrt{\frac{(0.75)^3}{(1-0.75)} + [0.75 + (0.75)^2 + 1]}$ का वर्गमूल क्या है?

[A] 1

[C] 3

[B] 2

[D] 4

$$\sqrt{\frac{\cancel{.75^3} + 1 - \cancel{.75^3}}{.25}} = \sqrt{\frac{1}{.25}} = \sqrt{4}$$

$$(1-.75)[.75+.75^2+1]=$$

127. Find the value of : $\frac{183 \times 183 \times 183 - 73 \times 73 \times 73}{183 \times 183 + 183 \times 73 + 73 \times 73}$

का मान ज्ञात कीजिए : $\frac{183 \times 183 \times 183 - 73 \times 73 \times 73}{183 \times 183 \oplus 183 \times 73 \oplus 73 \times 73}$

(RRB GROUP D 2022)

$$= 183 - 73$$

[A] 210

[B] 110

[C] 256

[D] 136

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

128. *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

[B] 3.1

✓ ~~[D]~~ 5.1

$$\frac{6.1^3 - 1^3}{6.1^2 + 6.1 + 1^2} = 6.1 - 1$$

129. Simplify the following expression:

निम्नलिखित व्यंजक को सरल कीजिए:

$$\frac{6.5^3 - 5^3}{42.25 + 32.5 + 25}$$

(RRB GROUP D 2025)

[A] 3.5

[B] 2.5

[C] 1.5

[D] 0.5

$$= 6.5 - 5$$

130. 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**

[B] 4.508

[C] 2.146

[D] 3.156

$$= 3.254 - 0.746$$

131. 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

[C] 290

$$\frac{1}{157-133}$$

[B] $\frac{1}{290}$

☒ [D] $\frac{1}{24}$

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

132. 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

[B] 128

[D] 109

133. Find the value of the following expression:

निम्नलिखित व्यंजक का मान ज्ञात कीजिए:

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

[A] 7.06

[C] 7.33

[B] 7

[D] 6.73

$$= 7.03 - 0.3$$

$$= 6.73 \quad \cdot 0.027 = 0.3^3$$

134. The value of $\frac{5.169 \times 5.169 \times 5.169 - 64 \times (0.888)^3}{(5.169)^2 + (3.552)^2 + 4(0.888)(5.169)}$?

$\frac{5.169 \times 5.169 \times 5.169 - 64 \times (0.888)^3}{(5.169)^2 + (3.552)^2 + 4(0.888)(5.169)}$ का मान है?

[A] 1.323

[C] 1.625

[B] 1.617

[D] 1.317

$$= 5.169 - 3.552$$
$$= 1.617$$

$$4^3 \times 0.888^3$$
$$= 3.552^3$$

135. 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:

$\frac{(253)^3 + (247)^3}{25.3 \times 25.3 - 624.91 + 24.7 \times 24.7}$ का मान 50×10^k है, जहाँ k का मान है:

[A] 4

[C] 2

✓ [B] 3

[D] -3

$$100 \times (253 + 247)$$

$$\overset{1000}{50000} = 50 \times 10^{\textcircled{K}}$$

136. If $x = \sqrt[3]{65}$ and $y = 4$, find $x + y - \frac{1}{x^2 + xy + y^2}$?

यदि $x = \sqrt[3]{65}$, $y = 4$ है, तो $(x + y) - \frac{1}{x^2 + xy + y^2}$ ज्ञात कीजिये?

[A] 0

[C] -8

[B] 8

[D] 2

(special)

$$(x+y) \cdot \frac{xy}{(x^3 + xy^2 + y^3)} = \frac{xy}{x^3 + y^3} = \frac{xy}{x^3 + y^3}$$

$$\begin{aligned} & \cancel{(x+y)} - \cancel{(x+y)} \\ &= xy \\ &= 8 \end{aligned}$$

137. **Simplify:** $\frac{(3x)^3 - (4z)^3}{9x^2 + 12xz + 16z^2} \times (3x + 4z)$

$\frac{(3x)^3 - (4z)^3}{9x^2 + 12xz + 16z^2} \times (3x + 4z)$ को सरलीकृत कीजिए।

[RRB Group- D 2025]

[A] $9x^2 + 16z^2$

[C] $\frac{1}{9x^2 - 16z^2}$

[B] $9x^2 - 16z^2$

[D] $\frac{1}{9x^2 + 16z^2}$

$(3x - 4z) \times (3x + 4z)$

138. If $A = \frac{0.125+0.729}{0.25-0.45+0.81} - 0.25 + \frac{12}{20} - \frac{6}{8}$, then the value of A is:

यदि $A = \frac{0.125+0.729}{0.25-0.45+0.81} - 0.25 + \frac{12}{20} - \frac{6}{8}$ है, तो A का मान ज्ञात कीजिए।

[A] 1

[C] 2

[B] 1.4

[D] 0

$$\begin{aligned} A &= 1.4 - 0.25 + 0.6 - 0.75 \\ &= 2 - 1 = 1 \end{aligned}$$

$\cdot 5 + \cdot 9$

$\cdot 5^3 + \cdot 9^3$

ALGEBRA BASED SIMPLIFICATION FORMULAS

$$a^3 + b^3 + c^3 - 3abc = (a + b + c) \times (a^2 + b^2 + c^2 - ab - bc - ca)$$

$$\frac{a^3 + b^3 + c^3 - 3abc}{(a^2 + b^2 + c^2 - ab - bc - ca)} = (a + b + c)$$



139.

$$\frac{\frac{1}{3} + \frac{1}{4} + \frac{1}{5} - 3 \cdot \frac{1}{3 \cdot 4 \cdot 5}}{\frac{1}{3} + \frac{1}{4} + \frac{1}{5} - \left(\frac{1}{3 \cdot 4} + \frac{1}{4 \cdot 5} + \frac{1}{5 \cdot 3} \right)} = ?$$

[A]

$$\frac{2}{3}$$

[C]

$$\frac{47}{60}$$

[B]

$$\frac{3}{4}$$

[D]

$$\frac{49}{60}$$

$$= \frac{1}{3} + \frac{1}{4} + \frac{1}{5}$$

$$= \frac{20 + 15 + 12}{60}$$

140. Simplify the expression $\frac{(2.3)^3 + (15.9)^3 + (3.7)^3 - 3 \times 2.3 \times 15.9 \times 3.7}{(2.3)^2 + (15.9)^2 + (3.7)^2 - 2.3 \times 15.9 - 15.9 \times 3.7 - 3.7 \times 2.3}$?

व्यंजक $\frac{(2.3)^3 + (15.9)^3 + (3.7)^3 - 3 \times 2.3 \times 15.9 \times 3.7}{(2.3)^2 + (15.9)^2 + (3.7)^2 - 2.3 \times 15.9 - 15.9 \times 3.7 - 3.7 \times 2.3}$ को सरल कीजिए?

[SSC SELECTION POST (PHASE XII) 2024] (RRB GROUP D 2024)

[A] 17.6

[B] 14.5

[C] 20.9

[D] 21.9

$$= 2.3 + 15.9 + 3.7$$

$$= 20 + 1.9$$

141. Simplify :
$$\frac{(2.33)^3 + (1.55)^3 + (1.22)^3 - 3 \times 2.33 \times 1.55 \times 1.22}{(2.33)^2 + (1.55)^2 + (1.22)^2 - 3.6115 - 2.8426 - 1.891}$$

सरल करें:
$$\frac{(2.33)^3 + (1.55)^3 + (1.22)^3 - 3 \times 2.33 \times 1.55 \times 1.22}{(2.33)^2 + (1.55)^2 + (1.22)^2 - 3.6115 - 2.8426 - 1.891}$$

(RRB NTPC GRADUATE LEVEL CBT – 1 2025)

[A] 5.2

[C] 5.3

✓ [B] 5.1

[D] 5

$$= 2.33 + 1.55 + 1.22$$

$$= 5.1$$

142. The value of $\frac{[(2.5)^3 + (4.7)^3 + (2.8)^3 - 7.5 \times 4.7 \times 2.8]}{[(25)^2 + (47)^2 + (28)^2 - 25 \times 47 - 47 \times 28 - 28 \times 25]} = ?$

$\frac{10^{-3} \times [(2.5)^3 + (4.7)^3 + (2.8)^3 - 7.5 \times 4.7 \times 2.8]}{[(25)^2 + (47)^2 + (28)^2 - (25 \times 47 - 47 \times 28 - 28 \times 25)]}$ का मान क्या है?

[A] 0.1

[B] 0.001

[C] 1

[D] 0.01

$$\frac{1}{1000} \times 100 = \frac{1}{10}$$

$$(25 + 47 + 28)$$

ALGEBRA BASED SIMPLIFICATION FORMULAS

$$a^3 + b^3 + c^3 - 3abc = (a + b + c) \times (a^2 + b^2 + c^2 - ab - bc - ca)$$

○ *cong no*

यदि, $a + b + c = 0$
 तौ

$$a^3 + b^3 + c^3 - 3abc = 0$$

या

$$a^3 + b^3 + c^3 = 3abc$$

lllll

143. Simplify : $21^3 + 13^3 - 34^3 + 3 \times 21 \times 13 \times 34$

सरल करें: $21^3 + 13^3 - 34^3 + 3 \times 21 \times 13 \times 34$

(RRB GROUP D 2024)

[A] 9282

~~[B] 0~~

[C] 68

[D] 1

$$21^3 + 13^3 + (-34)^3 - 3 \times 21 \times 13 \times (-34) = 0$$

$$21 + 13 + (-34) = 0$$

144. Evaluate $25^3 + (-7)^3 + (-18)^3$.

$25^3 + (-7)^3 + (-18)^3$ का मान ज्ञात कीजिए।

[RRB NTPC 12TH LEVEL CBT-1, 2026]

[A] 9450

[B] ~~9490~~

[C] ~~9173~~

[D] ~~9350~~

$$25 + (-7) + (-18) = 0$$

$$= 3 \times 25 \times -7 \times 18$$

$$\div 9$$