

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

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यदि, $a + b + c = 0$

तो { $a^3 + b^3 + c^3 - 3abc = 0$

या

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



If $a + b + c = 0$, then

तों



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

या

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



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



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

या

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

$a + b + c = 0$ या $a = b = c$



If, $a^3 + b^3 + c^3 = 3abc$ and a, b & c are real positive numbers, then which of the following option is correct?

(A) $a + b + c = 0$

(B) $a = b = c$

(C) $a \neq b \neq c$

(D) $a + b - c = 0$

$a + b + c = 0$ ✗

या

$a = b = c$ ✓



If $a^3 + b^3 + c^3 = 3abc$ and a, b & c are distinct numbers, then which of the following options is correct?

(A) $a + b + c = 0$

(B) $a = b = c$

(C) $a \neq b \neq c$

(D) $a + b - c = 0$

$$\left\{ \begin{array}{l} a + b + c = 0 \checkmark \\ \text{या} \\ a = b = c \times \end{array} \right.$$



49. $x^a \cdot x^b \cdot x^c = 1$, then $a^3 + b^3 + c^3 = ?$

यदि $x^a \times x^b \times x^c = 1$, तो $a^3 + b^3 + c^3 = ?$

(RRB NTPC 2021)

[A] 9

[B] abc

[C] $a+b+c$

✓ [D] $3abc$

$$x^0 = 1$$

$$x^{a+b+c} = 1$$

$$\Rightarrow a+b+c=0$$

50. $(32)^3 + (79)^3 - (111)^3 + 3 \times 32 \times 79 \times 111$ is equal to.

$(32)^3 + (79)^3 - (111)^3 + 3 \times 32 \times 79 \times 111$ किसके बराबर है?

[A] 10000

[B] 0 ✓

[C] 30007

[D] 1

$$32^3 + 79^3 + (-111)^3 - 3 \times 32 \times 79 \times (-111) = 0$$

$$\Rightarrow 32 + 79 + (-111) = 0$$

51. $55^3 + 17^3 - 72^3 + 201960$ is equal to:

$55^3 + 17^3 + (-72)^3 + 201960$ बराबर है:

(SSC CPO 2025)

[A] 0 ✓

[B] 1

[C] 2

[D] 3

52. If $p = 8.15$, $q = 9.06$ and $r = -17.21$, then the value of $p^3 + q^3 + r^3 - 3pqr$ is:
यदि $p = 8.15$, $q = 9.06$ और $r = -17.21$ है, तो $p^3 + q^3 + r^3 - 3pqr$ का मान क्या होगा?

(SSC CGL 2022)

[A] -3.81

[B] -5.62

[C] 4.75

[D] 0 ✓

if, $p + q + r = 0$

53. If $a + b + c = 0$, then the value of $(a^3 + b^3 + c^3)^2$ is:

यदि $a + b + c = 0$ है, तो $(a^3 + b^3 + c^3)^2$ का मान कितना है?

(RRB GROUP - D 2026) $= (3abc)^2$

[A] $3a^2b^2c^2$

[B] $9abc$

[C] $6a^2b^2c^2$

[D] $9a^2b^2c^2$

54. If $x + y + z = 0$ and $xyz = 21$, then $x^3 + y^3 + z^3$ is equal to:

यदि $x + y + z = 0$ और $xyz = 21$ है, तो $x^3 + y^3 + z^3$ का मान ज्ञात कीजिए।

(RRB GROUP - D 2026)

[A] 0

[C] 63

[B] 21

[D] 42

$$= 3xyz$$
$$= 3 \times 21$$

55. If $p + q = r$; $pqr = -36$ then find $p^3 + q^3 - r^3 = ?$

यदि $p + q = r$ और $pqr = -36$ है, तो $p^3 + q^3 - r^3$ का मान ज्ञात कीजिए।

[A] 72

[B] 105

[C] 0

[D] 108

$$p^3 + q^3 + (-r)^3 = -3pqr$$

$$= -3 \times -36$$

$$p^3 + q^3 - r^3 = 108$$

56. If $a = 323$, $b = 427$ & $c = 750$, then find the value of $a^3 + b^3 - c^3 + 3abc$?
यदि $a = 323$, $b = 427$ & $c = 750$ है, तो $a^3 + b^3 - c^3 + 3abc$ का मान ज्ञात किजिए?

[A] 1500

[B] 731290

[C] 77

[D] 0

$$a + b + (-c) = 0$$

57. If $x + 3y + 2 = 0$, then value of $x^3 + 27y^3 + 8 - 18xy$ is:

यदि $x + 3y + 2 = 0$ है, तो $x^3 + 27y^3 + 8 - 18xy$ का मान ज्ञात कीजिए।

(RRB GROUP - D 2026)

[A] 1

[C] 2

[B] 0

[D] -2

58. If $a+b+c=27$, then what is the value of $(a-7)^3 + (b-9)^3 + (c-11)^3 - 3(a-7)(b-9)(c-11)$?

यदि $a+b+c=27$, तो $(a-7)^3 + (b-9)^3 + (c-11)^3 - 3(a-7)(b-9)(c-11)$ का मान क्या है?

[A] 0

[B] 9

[C] 27

[D] 81

$$(a-7) + (b-9) + (c-11) = 27 - 27 \\ = 0$$

59. If $x^3 + 27y^3 + 64z^3 = 36xyz$, then the relationship between x , y and z is:

यदि $x^3 + 27y^3 + 64z^3 = 36xyz$ है, तो x , y और z का संबंध है:

(RRB GROUP - D 2026)

[A] $x + y + z = 0$

[B] $x - 3y + 4z = 0$

[C] $x + 3y = 4z$

☒ [D] $x + 3y + 4z = 0$

$$x^3 + (3y)^3 + (4z)^3 = 3x \cdot x \cdot 3y \cdot 4z$$

$$\Rightarrow x + 3y + 4z = 0$$

60. If $2a + b + c = 0$ and $8a^3 + b^3 + c^3 = kabc$, then find the value of k^2 .

यदि $2a + b + c = 0$ और $8a^3 + b^3 + c^3 = kabc$ है, तो k^2 का मान ज्ञात कीजिए।

(RRB GROUP - D 2026)

[A] 49

[B] 16

[C] 81

[D] 36

$3 \times 3 \times 3$

61. If $\sqrt{2}x + 2\sqrt{2}y + z = 0$ & $(2\sqrt{2}x^3 + 16\sqrt{2}y^3 + z^3) = kxyz$, then find the value of k?
यदि $\sqrt{2}x + 2\sqrt{2}y + z = 0$ & $(2\sqrt{2}x^3 + 16\sqrt{2}y^3 + z^3) = kxyz$ है, तो k का मान ज्ञात कीजिये?

[A] -6

[B] 6

[C] 12

[D] -12

$3x^3 + 16y^3 + z^3$

$= 12xyz$

62. If $a = \frac{1}{14}$, $b = \frac{1}{14}$ and $c = -\frac{1}{7}$, then value of $a^3 + b^3 + c^3$ is:

यदि $a = \frac{1}{14}$, $b = \frac{1}{14}$ और $c = -\frac{1}{7}$ है, तो $a^3 + b^3 + c^3$ का मान ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1 2026)

[A] $\frac{3}{1372}$ ✗

[B] $\frac{1}{1372}$ ✗

[C] $\frac{-1}{1372}$ ✗

[D] $\frac{-3}{1372}$ ✓

$3 \times \frac{1}{14} \times \frac{1}{14} \times -\frac{1}{7}$

$a + b + c = 0$

63. $(a-b)^3 + (b-c)^3 + (c-a)^3 = ?$, which of the following should come in place of ? so that relation always holds true?

$(a-b)^3 + (b-c)^3 + (c-a)^3 = ?$, निम्नलिखित में से प्रश्न चिन्ह '?' के स्थान पर क्या आना चाहिए, ताकि संबंध सदैव सत्य हो?

(RRB TECHNICIAN GRADE-3, 2024)

[A] $2(a-b)(b-c)(c-a)$

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

[C] $3(a-b)(b-c)(c-a)$

[D] $(a-b)(b-c)(c-a)$

$$\Rightarrow \cancel{(a-b)} + (b-c) + (c-\cancel{a}) = 0$$

64. $[(4a-5b)^3 + (5b-3c)^3 - (4a-3c)^3]$ is equal to:-

$[(4a-5b)^3 + (5b-3c)^3 - (4a-3c)^3]$ का मान क्या होगा?

[A] $-3(4a-5b)(5b-3c)(4a-3c)$

[B] $60abc$

[C] 0

[D] $3(4a-5b)(5b-3c)(4a-3c)$

65. If $x = a(b - c)$, $y = b(c - a)$, $z = c(a - b)$, then $\left(\frac{x}{a}\right)^3 + \left(\frac{y}{b}\right)^3 + \left(\frac{z}{c}\right)^3 = ?$

यदि $x = a(b - c)$, $y = b(c - a)$, $z = c(a - b)$, तो $\left(\frac{x}{a}\right)^3 + \left(\frac{y}{b}\right)^3 + \left(\frac{z}{c}\right)^3 = ?$

[A] $\frac{xyz}{3abc}$
[C] $\frac{3xyz}{abc}$

[B] $3xyzabc$

[D] $\frac{xyz}{abc}$

$$\frac{x}{a} = \cancel{b} - \cancel{c}$$

$$\frac{y}{b} = \cancel{c} - \cancel{a}$$

$$\frac{z}{c} = \cancel{a} - \cancel{b}$$

$$\frac{\cancel{a}\cancel{b}}{\cancel{a}} + \frac{\cancel{b}\cancel{c}}{\cancel{b}} + \frac{\cancel{c}\cancel{a}}{\cancel{c}} = 0$$

66. If $x + y + z = 0$, then $\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy} = ?$
 यदि $x + y + z = 0$ है, तो $\frac{x^2}{yz} + \frac{y^2}{zx} + \frac{z^2}{xy} = ?$

SSC CHSL TIER - I 2022

[A] 2

[C] 0

[B] 3

[D] 1

$$\frac{x^3 + y^3 + z^3}{xyz} = \frac{3xyz}{xyz}$$

67. If $2x - y + 3z = 0$, then find the value of $\frac{4x^2}{yz} - \frac{y^2}{2xz} + \frac{27z^2}{2xy}$?

यदि $2x - y + 3z = 0$ है, तो $\frac{4x^2}{yz} - \frac{y^2}{2xz} + \frac{27z^2}{2xy}$ का मान ज्ञात कीजिये?

[A] -9 ✓

[B] 18

[C] -3

[D] 9

$$\begin{aligned} & \frac{4x^3 - y^3 + 27z^3}{xyz} = \frac{3x^3 - y^3 + 27z^3}{xyz} \\ & = \frac{3x^3 - y^3 + 27z^3}{xyz} = -9 \end{aligned}$$

68. If $x+y+z=120$, then find $\frac{(x-20)^3 + (y-40)^3 + (z-60)^3}{(x-20)(y-40)(z-60)}$?

यदि $x+y+z=120$ है, तो $\frac{(x-20)^3 + (y-40)^3 + (z-60)^3}{(x-20)(y-40)(z-60)}$?

[A] 3

[B] 0

[C] 1

[D] 2

$$(x-20) + (y-40) + (z-60) = 0$$

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~~अब~~

69. **Simplify:** $\frac{(p-q)^3 + (q-r)^3 + (r-p)^3}{(p-q)(q-r)(r-p)}$

$\frac{(p-q)^3 + (q-r)^3 + (r-p)^3}{(p-q)(q-r)(r-p)}$ को सरल कीजिए।

(RRB GROUP - D 2026)

[A] 1

[B] $(p-q)$

☒ [C] 3

[D] pqr

$$\frac{3(p-q)(q-r)(r-p)}{(p-q)(q-r)(r-p)}$$

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

70. The value of $\frac{(a^2-b^2)^3 + (b^2-c^2)^3 + (c^2-a^2)^3}{(a-b)^3 + (b-c)^3 + (c-a)^3}$ **का मान कितना है?**

(RRB GROUP - D 2026)

- [A] $(a+b)(b+c)(c+a)$
- ✓ [B] $2(a-b)(b-c)(c-a)$
- [C] $(a-b)(b-c)(c-a)$
- [D] $3abc$

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

71. $\frac{(4.53-3.07)^2}{(3.07-2.15)(2.15-4.53)} + \frac{(3.07-2.15)^2}{(2.15-4.53)(4.53-3.07)} + \frac{(2.15-4.53)^2}{(4.53-3.07)(3.07-2.15)}$ is simplified to:

$\frac{(4.53-3.07)^2}{(3.07-2.15)(2.15-4.53)} + \frac{(3.07-2.15)^2}{(2.15-4.53)(4.53-3.07)} + \frac{(2.15-4.53)^2}{(4.53-3.07)(3.07-2.15)}$ को सरल करने पर प्राप्त होता है:

[A] 0

[B] 1

[C] 2

[D] 3 ✓

$$\begin{aligned} a &= 4.53 \\ b &= 3.07 \\ c &= 2.15 \end{aligned}$$

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

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

$$= 3$$

72. If a, b, c are three distinct real numbers such that $a^3 + b^3 + c^3 = 3abc$ then

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

अगर a, b, c तीन अलग-अलग वास्तविक संख्याएँ इस प्रकार हैं $a^3 + b^3 + c^3 = 3abc$ तो

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

[A] 3

[B] 1

[C] 1.5

[D] 2

$$\Rightarrow a+b+c=0$$

$$= \frac{c^2}{2ab} + \frac{a^2}{2bc} + \frac{b^2}{2ca}$$

$$a+b=-c$$

$$= \frac{c^3 + a^3 + b^3}{2abc} = \frac{3abc}{2abc}$$

73. If $4s = x + y + z$, then $(3s - x)^3 + (s - y)^3 + 3(3s - x)(s - y)z = ?$
यदि $4s = x + y + z$ है, तो $(3s - x)^3 + (s - y)^3 + 3(3s - x)(s - y)z = ?$

[A] z^3 ✓

[B] $-z^3$

[C] $2z^3$

[D] 0

$$(3s - x) + (s - y) + (-z) = 0$$

$$(3s - x)^3 + (s - y)^3 - z^3 + 3(3s - x)(s - y)z = 0$$

74. **Evaluate/ मान ज्ञात कीजिए।**

$$24^3 + (-7)^3 + (-17)^3$$

(RRB NTPC UNDER GRADUATE LEVEL CBT-1 2026)

[A] ~~8450~~

[B] ~~8345~~

[C] 8568

[D] 8396

$$24 + (-7) + (-17) = 0$$

$$3 \times 24 \times -7 \times -17$$

75. Find the value of $23^3 + (-11)^3 + (-12)^3$?

$23^3 + (-11)^3 + (-12)^3$ का मान ज्ञात कीजिये?

(RRB NTPC UNDER GRADUATE LEVEL CBT-1 2026)

~~[A] 8908~~

~~[B] 8608~~

☒ [C] 9108

~~[D] 8708~~

→ $3 \times 23 \times -11 \times -12$

$\therefore 9$

76. The value of $\frac{(0.545)(0.081)(0.51)(5.2)}{(0.324)^3 + (0.221)^3 - (0.545)^3}$ is:

$\frac{(0.545)(0.081)(0.51)(5.2)}{(0.324)^3 + (0.221)^3 + (-0.545)^3}$ का मान है:

(RRB NTPC GRADUATE LEVEL CBT-1 2021)

[A] -3

[C] -1

[B] 3

[D] 1

$$\frac{.545 \times .081 \times .51 \times 5.2}{.3 \times .324 \times .221 - .545}$$

= -1

77. The expression $(a + b - c)^3 + (a - b + c)^3 - 8a^3$ is equal to:

व्यंजक $(a + b - c)^3 + (a - b + c)^3 - 8a^3$ का मान ज्ञात करें।

[A] ~~$6a(a+b-c)(a-b+c)$~~

☒ [B] $6a(a-b+c)(c-a-b)$

[C] ~~$3a(a+b-c)(a-b+c)$~~

[D] ~~$3a(a-b+c)(c-a-b)$~~

$$(a+b-c)^3 + (a-b+c)^3 + (-2a)^3$$

$$= 3 \times (a+b-c) \cdot (a-b+c) \times (-2a)$$

78. If $(a-1)^3 + (a-4)^3 + (a-7)^3 = 3(a-1)(a-4)(a-7)$, find the value of a .

यदि $(a-1)^3 + (a-4)^3 + (a-7)^3 = 3(a-1)(a-4)(a-7)$ है, तो a का मान ज्ञात कीजिए।

[A] 4

[B] -1

[C] 1

[D] -4

$$(a-1) + (a-4) + (a-7) = 0$$

$$3a - 12 = 0$$

$$a = 4$$

79. If $(5x + 1)^3 + (x - 3)^3 + 8(3x - 4)^3 = 6(5x + 1)(x - 3)(3x - 4)$, then x is equal to:

यदि $(5x + 1)^3 + (x - 3)^3 + [2(3x - 4)]^3 = 6(5x + 1)(x - 3)(3x - 4)$, तो x बराबर है:

(RRB NTPC GRADUATE LEVEL CBT-1 2026)

[A] $\frac{5}{6}$
[C] $\frac{1}{3}$

[B] $\frac{3}{4}$
[D] $\frac{2}{3}$

$$(5x+1) + (x-3) + (6x-8) = 0$$

$$12x - 10 = 0$$

$$x = \frac{5}{6}$$

80. If $(9x - 7)^3 + 8(5 - x)^3 - 27(4x + 11)^3 = 18(7 - 9x)(5 - x)(4x + 11)$, then find $\frac{x^4 + x^2 + 1}{x^2 - x + 1}$?

यदि $(9x - 7)^3 + [2(5 - x)]^3 + [-3(4x + 11)]^3 = 18(7 - 9x)(5 - x)(4x + 11)$ है, तो $\frac{x^4 + x^2 + 1}{x^2 - x + 1}$ ज्ञात कीजिये?

[A] 33

[B] 30

[C] 31

[D] 27

$$(9x - 7) + (10 - 2x) + (-12x - 33) = 0$$

$$-5x - 30 = 0$$

$$-5x = 30$$

$$x = -6$$

$$\begin{aligned} &= x^2 + x + 1 \\ &= 36 - 6 + 1 \\ &= 31 \end{aligned}$$