



Updated

By Pushpendra Sir

ALGEBRA

TO CHANGE THE SYMBOL

Part
01

1. If $x + \frac{1}{x} = 3$, then find out the value of $x - \frac{1}{x}$.
- (A) $\pm\sqrt{3}$ (B) $\pm\sqrt{5}$
(C) $\pm\sqrt{7}$ (D) $\pm\sqrt{10}$
2. If $x^{2009} - \frac{1}{x^{2009}} = 13$, then find out the value of $x^{2009} + \frac{1}{x^{2009}}$.
- (A) $\pm\sqrt{173}$ (B) $\pm\sqrt{171}$
(C) $\pm\sqrt{170}$ (D) $\pm\sqrt{179}$
3. If $x^5 + \frac{1}{x^5} = 7$, $x^5 - \frac{1}{x^5} = ?$
- (A) $\pm 3\sqrt{5}$ (B) $\pm 2\sqrt{5}$
(C) ± 10 (D) ± 12
4. If $x^5 + \frac{1}{x^5} = 3$, $x^5 = ?$
- (A) $\frac{3 \pm \sqrt{5}}{2}$ (B) $\frac{2 \pm \sqrt{5}}{2}$
(C) $\frac{5 \pm \sqrt{2}}{2}$ (D) None
5. If $3x - \frac{2}{x} = 5$, $x^3 + \frac{2}{x} = ?$
- (A) ± 8 (B) ± 7
(C) ± 5 (D) ± 10
6. If $3x - \frac{1}{4x} = 3$, $4x + \frac{1}{3x} = ?$
- (A) ± 5 (B) ± 3
(C) ± 8 (D) None
7. If $3x + \frac{2}{x} = 7$, $9x^2 - \frac{4}{x^2} = ?$
- (A) 25 (B) 35
(C) 49 (D) 50
8. If $2x^2 - 4\sqrt{10}x + 7 = 0$, $\frac{2}{7}x - \frac{1}{x} = ?$
- (A) $\frac{\sqrt{128}}{7}$ (B) $\frac{\sqrt{104}}{7}$
(C) $\frac{\sqrt{102}}{7}$ (D) $\frac{\sqrt{52}}{7}$
9. If $\frac{A+B}{\sqrt{AB}} = 10\sqrt{2}$, $\frac{A-B}{\sqrt{AB}} = ?$
- (A) 12 (B) 14
(C) 13 (D) 10
10. If $x + \frac{1}{x} = c + \frac{1}{c}$, $x = ?$
- (A) $c, \frac{1}{c}$ (B) c, c^2
(C) $c, 2c$ (D) 0, 1
11. If $\left(a + \frac{1}{a}\right)^2 - 2\left(a - \frac{1}{a}\right) = 12$, $a = ?$
- (A) $-8 + \sqrt{3}$ (B) $\sqrt{5} - 2$
(C) $-8 + \sqrt{5}$ (D) $\sqrt{5} + 2$
12. If $x + \frac{1}{x+7} = 0$, $x - \frac{1}{x+7} = ?$
- (A) $3\sqrt{5} - 5$ (B) $3\sqrt{5} - 7$
(C) $3\sqrt{7} - 5$ (D) $3\sqrt{7} - 7$



Updated

By Pushendra Sir

ALGEBRA

SQUARE AND CUBE

Part
02

1. If $5x^{\frac{7}{4}} - 3x^{\frac{7}{8}} + 5 = 0$, then find out the value of $x^{\frac{7}{4}} + x^{-\frac{7}{4}}$
- (A) $-\frac{41}{25}$ (B) $-\frac{21}{25}$
(C) $\frac{41}{25}$ (D) 0
2. If $x - 5\sqrt{x} - 1 = 0$, then $x^2 + \frac{1}{x^2}$ is equal to
- (A) 625 (B) 731
(C) 729 (D) 727
3. If $x + \frac{1}{x} = \frac{\sqrt{3}+1}{2}$, then find out the value of $x^4 + \frac{1}{x^4} = ?$
- (A) $\frac{4\sqrt{3}-1}{4}$ (B) $\frac{4\sqrt{3}+1}{2}$
(C) $\frac{-4\sqrt{3}-1}{4}$ (D) $\frac{-4\sqrt{3}-1}{2}$
4. If $\sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{15}$, then find out the value of $x\sqrt{x} + \frac{1}{x\sqrt{x}} = ?$
- (A) $12\sqrt{15}$ (B) $13\sqrt{15}$
(C) $10\sqrt{15}$ (D) $14\sqrt{15}$
5. If $x^{130} + \frac{1}{x^{130}} = 9$, then find out the value of $x^{390} - \frac{1}{x^{390}} = ?$
- (A) $74\sqrt{77}$ (B) $80\sqrt{77}$
(C) $81\sqrt{77}$ (D) 1
6. If $x + \frac{1}{25x} = 1$, then find out the value of $125x^3 + 125\frac{1}{125x} = ?$
- (A) 238 (B) 236
(C) 235 (D) 242
7. If $x^{\frac{3}{4}} + \frac{1}{x^{\frac{3}{4}} + 9} = 0$, then find out the value of $\left(x^{\frac{3}{4}} + 9\right)^2 - \frac{1}{\left(x^{\frac{3}{4}} + 9\right)} = ?$
- (A) $\sqrt{76}$ (B) $\sqrt{70}$
(C) $\sqrt{79}$ (D) $9\sqrt{77}$



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ALGEBRA

Part
03

CORRECT THE GIVEN FUNCTION

1. If $x + \frac{1}{9x} = 3$, then find the value of

$$27x^3 + \frac{1}{27x^3} \text{ is}$$

- (A) 488 (B) 702
(C) 970 (D) None

2. If $x + \frac{1}{x+2} = 6$, $(x+2)^3 + \frac{1}{(x+2)^3} = ?$

- (A) 400 (B) 488
(C) 702 (D) 198

3. If $4x - \frac{1}{5x} = 6$, $1000x - \frac{1}{8x^3} = ?$

- (A) 3500 (B) 3200
(C) 3600 (D) 3000

4. If $x + \frac{1}{16x} = 3$, $16x^3 + \frac{1}{256x^3} = ?$

- (A) 422 (B) 433
(C) 423 (D) 440

5. If $9b^2 + \frac{1}{b^2} = 3$, $27b^3 + \frac{1}{b^3} = ?$

- (A) 1 (B) 2
(C) 3 (D) 0

6. If $4b^2 + \frac{1}{b^2} = 2$, $8b^3 + \frac{1}{b^3} = ?$

- (A) 2 (B) 0
(C) 4 (D) 3

7. If $6x - \frac{4}{9x} = 1$, then $729x^3 - \frac{8}{27x^3} = ?$

- (A) $\frac{99}{8}$ (B) $\frac{195}{8}$
(C) $\frac{41}{4}$ (D) $\frac{243}{8}$



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DIVIDE THE NUMERATOR AND DENOMINATOR

Part
04

1. If $x + \frac{1}{x} = 5$, then find out $\frac{2x}{3x^2 - 5x + 3}$ = ?
- (A) $\frac{1}{3}$ (B) $\frac{1}{5}$
- (C) $\frac{1}{2}$ (D) $\frac{1}{4}$
2. If $x + \frac{1}{x} = 3$, then find out the value of $\frac{x^4 + 5x^3 + 3x^2 + 5x + 1}{x^4 + 1}$ is
- (A) $\frac{25}{7}$ (B) $\frac{20}{7}$
- (C) $\frac{15}{7}$ (D) $\frac{12}{7}$
3. If $x^2 + 1 = 3x$, then find out the value of $\frac{x^4 + x^{-2}}{x^2 + 5x + 1}$ is
- (A) $\frac{5}{4}$ (B) $\frac{9}{4}$
- (C) $\frac{4}{9}$ (D) 1
4. If $x + \frac{1}{x} = 17$, then find out the value of $\frac{x^4 + \frac{1}{x^2}}{x^2 - 3x + 1}$ is
- (A) $\frac{2431}{7}$ (B) $\frac{2435}{7}$
- (C) 1 (D) $\frac{2501}{7}$
5. If $x - \frac{1}{x} = 3$, then find the value of $\frac{2x^4 + 3x^3 + 13x^2 - 3x + 2}{3x^4 + 3}$ is
- (A) $\frac{3}{4}$ (B) 1
- (C) $\frac{5}{4}$ (D) $\frac{4}{3}$



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ALGEBRA

Part
05

1. If $x(x - 3) = -1$, then $x^2(x^2 - 7) = ?$

- (A) 0 (B) 1
(C) -1 (D) 2

2. If $x(x - 3\sqrt{3}) = 1$, then find out the value $x^3(x^3 - 90\sqrt{3})$ is

- (A) 1 (B) 0
(C) -1 (D) 3

3. If $\sqrt{x} + \frac{1}{\sqrt{x}} = 11$, $x > 0$, then find

$$x\sqrt{x}(x\sqrt{x} - 1298).$$

- (A) -1 (B) 1
(C) 0 (D) 2

4. If $x(x - 5) = -1$, then find out the value of $x^4(x^4 - 527)$ is

- (A) 1 (B) -1
(C) 0 (D) 3



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Part
06

1. If $x^2 - \sqrt{7}x - 1 = 0$, then $x^{10} - 78x^6 - 79x^2$ will be -
(A) -5 (B) 7
(C) -9 (D) 10
2. If $x^2 - \sqrt{6}x - 1 = 0$, then $x^{10} - 61x^6 - 62x^2$ will be -
(A) -8 (B) 8
(C) 7 (D) -7
3. If $x + \frac{1}{x} = 4$, $x^9 + x^7 - 194x^5 - 194x^3 = ?$
(A) 4 (B) 3
(C) 2 (D) -4
4. If $x + \frac{1}{x} = 3$, $x^8 + x^7 - 18x^4 - 123x^3 + x^2 + x = ?$
(A) $5\sqrt{5}$ (B) $3\sqrt{5}$
(C) $5\sqrt{3}$ (D) None
5. $x = \frac{5 + \sqrt{21}}{2}$, $x^{11} + x^7 - 2525x^6 - 527x^3 = ?$
(A) 3 (B) 2
(C) 4 (D) -5
6. $x = 3 + 2\sqrt{2}$, $x^9 + x^7 - 198x^6 - 24\sqrt{2}x^5 = ?$
(A) $144\sqrt{2}$ (B) $150\sqrt{2}$
(C) $-128\sqrt{2}$ (D) 0



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ALGEBRA

(G.P.)

Part
07

1. If $a + a^2 + a^3 = 1$, then find $a^3 + \frac{1}{a}$ is
- (A) 1 (B) 2
(C) 3 (D) 4
2. If $a^3 + 3a^2 + 9a = 1$, then find $a^3 + \frac{3}{a}$ is
- (A) 28 (B) 30
(C) 27 (D) 0
3. If $a + a^2 + a^3 + a^4 - 2 = 0$, then find $a^4 + \frac{2}{a}$ is
- (A) 1 (B) 2
(C) 4 (D) 3
4. If $a^2 = a + 7$, then what is the value of a^3 .
- (A) $8a + 7$ (B) $a + 2$
(C) $a + 1$ (D) $4a + 7$
5. If $a^4 + a^3 + a^2 + a + 1 = 0$, then what is the value of $a^{15} + a^{10} - 2$.
- (A) 0 (B) 1
(C) 2 (D) 3
6. If $a^5 + a^4 + a^3 + a^2 + a + 1 = 0$, then find the value of $a^{36} + a^{18} + 1$
- (A) 0 (B) 2
(C) 5 (D) 3
7. If $x^2 + 2 = 2x$, then $x^4 - x^3 + x^2 + 2$.
- (A) 3 (B) 2
(C) 0 (D) None



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ALGEBRA QUADRATIC

Part
08

1. If $x^2 - 12x + 33 = 0$, then find out the

value $(x-4)^4 + \frac{1}{(x-4)^4}$

- (A) 227 (B) 326
(C) 167 (D) 194

2. If $x^2 + x = 5$, $(x+3)^3 + \frac{1}{(x+3)^3} = ?$

- (A) 110 (B) 125
(C) 140 (D) 0

3. If $x^2 - 16x + 59 = 0$,

$(x-6)^2 + \frac{1}{(x-6)^2} = ?$

- (A) 12 (B) 16

- (C) 18 (D) 20

4. If $4x^2 - 18x - 35 = 0$,

$(2x+3)^3 - \frac{1}{(2x+3)^3} = ?$

- (A) $224\sqrt{221}$ (B) $226\sqrt{227}$

- (C) $224\sqrt{229}$ (D) $225\sqrt{226}$



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ALGEBRA

($A^3 + B^3$ FORMULA)

Part
09

1. If $x^6 - 512y^6 = (x^2 + Ay^2)(x^4 - Bx^2y^2 + Cy^4)$, find $A + B - C$
- (A) -80 (B) -72
(C) 72 (D) 48
2. If $8x^3 - 27y^3 = (Ax + By)(Cx^2 - Dy^2 + 6xy)$, find $A + B + C - D$
- (A) 15 (B) -12
(C) 12 (D) 9
3. If $(5\sqrt{5}x^3 - 81\sqrt{3}y^3) + (\sqrt{5}x - 3\sqrt{3}y) = (Ax^2 + By^2 + Cxy)$, then find out the value of $6A + B - \sqrt{15}C$.
- (A) 9 (B) 15
(C) 10 (D) 12
4. If $8(x + y)^3 - (x - y)^3 = (x + 3y)(Ax^2 + Bxy + Cy^2)$, then find out the value of $A - B + C$.
- (A) 10 (B) 14
(C) 4 (D) -6
5. If $(8(x + y)^3 - 27(x - y)^3) \div (5y - x) = Ax^2 + Bxy + Cy^2$, then find out the value of $A + B + C$.
- (A) 19 (B) 16
(C) 13 (D) 26
6. If $\frac{1}{\sqrt[3]{9} + \sqrt[3]{3} + 1} = a\sqrt[3]{9} + b\sqrt[3]{3} + c$ (a, b, c are rational numbers), then $a + b + c$ is equal to
- (A) 0 (B) 1
(C) 2 (D) 3
7. If $\frac{1}{\sqrt[3]{4} + \sqrt[3]{2} + 1} = a\sqrt[3]{4} + b\sqrt[3]{2} + c$, a, b, c are rational numbers. Then find out the value of $a + b + c$.
- (A) 1 (B) 2
(C) 3 (D) 0
8. If $\frac{1}{\sqrt[3]{9} - \sqrt[3]{3} + 1} = a\sqrt[3]{9} + b\sqrt[3]{3} + c$, then find out the value of $a + b + c$.
- (A) 1 (B) 0
(C) $\frac{1}{2}$ (D) $\frac{1}{4}$
9. If $x^3 + y^3 + 1344$ and $x + y = 28$, then $(x + y)^2 - 3xy$ is equal to
- (A) 24 (B) 16
(C) 32 (D) 48
10. If $x^3 - y^3 = 416$ and $x - y = 8$, then $(x + y)^2 - xy$?
- (A) 52 (B) 42
(C) 38 (D) 32
11. If $\frac{1}{\sqrt[3]{25} - \sqrt[3]{5} + 1} = a\sqrt[3]{25} + b\sqrt[3]{5} + c$, then find out the value of $a + b + c$.
- (A) 1 (B) 0
(C) $\frac{1}{3}$ (D) $\frac{1}{4}$



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ALGEBRA TO EQUATE THE ZERO

Part
10

1. If $(x - 3)^2 + (y - 5)^2 + (z - 4)^2 = 0$, then find $\frac{x^2}{9} + \frac{y^2}{25} + \frac{z^2}{16}$.
(A) 2 (B) 0
(C) 5 (D) 3
2. $a^2 + b^2 + c^2 + 96 = 8(a + b - 2c)$, then $\sqrt{ab - bc + ca}$ is equal to
(A) $2\sqrt{3}$ (B) 4
(C) 6 (D) $2\sqrt{2}$
3. If $4a^2 + 9b^2 + c^2 = 2(4a + 3b - c) - 6$, then find $a^2 + b^2 + c^2$.
(A) $3\frac{1}{9}$ (B) $2\frac{2}{9}$
(C) $2\frac{1}{9}$ (D) 1
4. If $16x^2 + 9y^2 + 4z^2 = 24(x - y + z) - 61$, then $(xy + 2z)$ is equal to
(A) 2 (B) 3
(C) 5 (D) 1
5. If $(2a - 3)^2 + (3b + 4)^2 + (6c + 1)^2 = 0$, then find $\frac{a^3 + b^3 + c^3 - 3abc}{a^3 + b^3 + c^3}$, then find is
(A) 0 (B) 1
(C) 2 (D) 3
6. If $10x^2 + y^2 + 6xy + 2x + 1 = 0$, then $3x + 4y = ?$
(A) 9 (B) 12
(C) 10 (D) 7
7. If $8x^2 + y^2 - 12x - 4xy + 9 = 0$, then the value of $(14x - 5y)$ is
(A) 9 (B) 6
(C) 5 (D) 3
8. If $x^2 + (x - 2y - 1)^2 = -4y(x + y)$, then what is the value of $x + 3y$.
(A) 0 (B) $\frac{1}{4}$
(C) $-\frac{1}{4}$ (D) $\frac{1}{2}$
9. If $x^8 + 9 = \frac{x^4}{y^2}(10y^2 - y^4 - 4)$, then $x^{12}y^{10}$.
(A) 59 (B) 63
(C) 48 (D) 77



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ALGEBRA

(A.B = 1)

**Part
11**

1. If $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$, $y = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$, then

$$\frac{x^2}{y} + \frac{y^2}{x}.$$

- (A) 488 (B) 970
(C) 840 (D) 520

2. If $x = 2 + \sqrt{3}$, then $\frac{x^6 + x^4 + x^2 + 1}{x^3}$

- (A) 45 (B) 56
(C) 52 (D) 70

3. If $x = 3 + 2\sqrt{2}$ and $x \cdot y = 1$ find

$$\frac{x^3 + 3xy + y^3}{x^2 - 2xy + y^2}?$$

- (A) $\frac{201}{32}$ (B) $\frac{240}{29}$
(C) $\frac{204}{23}$ (D) None

4. If $x = \frac{\sqrt{13} + \sqrt{11}}{\sqrt{13} - \sqrt{11}}$ and $y = \frac{1}{x}$ then

$$3x^2 - 5xy + 3y^2?$$

- (A) 1717 (B) 1177
(C) 1771 (D) 1171

5. If $a = (\sqrt{3} + \sqrt{2})^{-5}$, $b = (\sqrt{3} - \sqrt{2})^{-5}$ find

$$\frac{1}{1+a} + \frac{1}{1+b}$$

- (A) 0 (B) 2

- (C) 3 (D) 1

6. If $x = \frac{\sqrt{2} + 1}{\sqrt{2} - 1}$ and $x - y = 4\sqrt{2}$ find $x^3 + \frac{1}{x^3}$

- (A) 198 (B) 110
(C) 322 (D) None

7. $x^{300} = \frac{6 - \sqrt{21}}{6 + \sqrt{21}}$, then $x^{300} = \frac{1}{x^{300}}?$

- (A) 8.6 (B) 6.7
(C) 8.7 (D) 7.6

8. If $x - \sqrt{3} - \sqrt{2} = 0$ and $y - \sqrt{3} + \sqrt{2} = 0$, then $(x^3 - 20\sqrt{2}) - (y^3 + 2\sqrt{2})?$

- (A) 3 (B) 0
(C) 1 (D) 2

9. If $x = 1 + \sqrt{2} + \sqrt{3}$ and $y = 1 + \sqrt{2} - \sqrt{3}$,

then $\frac{x^2 + 4xy + y^2}{x + y}$

- (A) 5 (B) 4
(C) 3 (D) 6

10. $\frac{\sqrt{7} - \sqrt{5}}{\sqrt{7} + \sqrt{5}} + \frac{\sqrt{7} + \sqrt{5}}{\sqrt{7} - \sqrt{5}} = ?$

- (A) 10 (B) 12
(C) 11 (D) 15



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ALGEBRA**Part
12****CYCLIC FUNCTION OR SYMMETRIC**

1. If $x = \left(\frac{a}{b}\right) + \left(\frac{b}{a}\right)$, $y = \left(\frac{b}{c}\right) + \left(\frac{c}{b}\right)$ and $z = \left(\frac{c}{a}\right) + \left(\frac{a}{c}\right)$, then what is the value of $xyz - x^2 - y^2 - z^2$.
- (A) -4 (B) 2
(C) -1 (D) -6
2. If $x = \frac{a-b}{a+b}$, $y = \frac{b-c}{b+c}$, $z = \frac{c-a}{c+a}$, then $\frac{(1-x)(1-y)(1-z)}{(1+x)(1+y)(1+z)}$
- (A) 1 (B) 2
(C) 0 (D) $\frac{1}{2}$
3. If $a + b + c = abc$, then $\frac{(1-a^2)(1-b^2)}{ab} + \frac{(1-b^2)(1-c^2)}{bc} + \frac{(1-c^2)(1-a^2)}{ca}$
- (A) 0 (B) 2
(C) 4 (D) 3
4. If $xy + yz + zx = 1$, then $\left(\frac{x+y}{1-xy} + \frac{y+z}{1-yz} + \frac{z+x}{1-zx}\right)$?
- (A) xyz (B) $\frac{1}{xyz}$
(C) 1 (D) 3
5. If $abc = 1$, then $\frac{a+1}{ab+a+1} + \frac{b+1}{bc+b+1} + \frac{c+1}{ca+c+1} = ?$
- (A) 1 (B) 2
(C) 3 (D) $\frac{1}{3}$
6. If $xy + yz + zx = 1$, then $\frac{1+x^2}{(x+y)(z+x)} + \frac{1+y^2}{(y+z)(x+y)} + \frac{1+z^2}{(z+x)(y+z)}$?
- (A) 1 (B) 2
(C) 3 (D) 4
7. If $x^2 + y^2 + z^2 = x + y + z$, $y^2 + z^2 = x + 1$ and $z^2 + x^2 = y + 1$, then find out the value of xyz .
8. If $a^2 + b + c$, $b^2 = c + a$ and $c^2 = a + b$, then $\frac{1}{1+a} + \frac{1}{1+b} + \frac{1}{1+c}$?
- (A) 0 (B) 2
(C) 4 (D) 1
9. If $\frac{x+a}{b+c} + \frac{x+b}{c+a} + \frac{x+c}{a+b} = -3$, then $x = ?$
- (A) $a + b + c$ (B) $-a - b - c$
(C) $(a + b + c)^2$ (D) $\sqrt{(a + b + c)}$
10. If $\frac{x+a^2}{b+c} + \frac{x-b^2}{c+a} + \frac{x-c^2}{a+b} = 4(a + b + c)$, then $x = ?$
- (A) $(a + b + c)^2$ (B) $a^2 + b^2 + c^2$
(C) $a + b + c$ (D) $a - b - c$
11. If $\frac{x+a^2+2c^2}{b+c} + \frac{x+b^2+2a^2}{c+a} + \frac{x+c^2+2b^2}{a+b} = 0$, then $x = ?$
- (A) $a^2 + b^2 + c^2$ (B) $-a^2 - b^2 - c^2$
(C) $a + b + c$ (D) None

12. If $\frac{M - a^2}{b^2 + c^2} + \frac{M - b^2}{c^2 + a^2} + \frac{M - c^2}{a^2 + b^2} = 3$ find M.

- (A) $a^2 + b^2 - c^2$ (B) $a^2 + b^2$
 (C) $a^2 + b^2 + c^2$ (D) $a^2 - b^2 - c^2$

13. If $bc + ca + ab = abc$, then find the value

$$\frac{b+c}{bc(a-1)} + \frac{c+a}{ca(b-1)} + \frac{a+b}{ab(c-1)}$$

- (A) 0 (B) 1
 (C) 2 (D) 3

14. If $x_1 \cdot x_2 \cdot x_3 = 4(4 + x_1 + x_2 + x_3)$

find $\frac{1}{2+x_1} + \frac{1}{2+x_2} + \frac{1}{2+x_3}$

- (A) $1/2$ (B) 3
 (C) 1 (D) 2



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ALGEBRA

THREE IDENTITY

**Part
13**

- If $x + \frac{1}{x} = 1$, then find out the value of given function.
 - $x^{18} + \frac{1}{x^{18}}$
 - $x^{17} + \frac{1}{x^{17}}$
 - $x^{14} + \frac{1}{x^{14}}$
- If $x^2 + \frac{1}{x^2} = 1$, then find out the value of $x^{56} + x^{50} + x^{46} + x^{40} + 1$
 - 1
 - 0
 - 2
 - 3
- If $x + \frac{1}{x} = \sqrt{3}$, then find $x^{48} + x^{42} + x^{36} + x^{30} + x^{27} + x^{21} + x^{18} + x^{12} + x^6 + 5$.
 - 2
 - 3
 - 5
 - 4
- If $x + \frac{1}{x} = \sqrt{2}$, then $x^{81} + \frac{1}{x^{81}}$?
 - 2
 - $\sqrt{2}$
 - 1
 - 3
- If $\left(x + \frac{1}{x} + 1\right)\left(x + \frac{1}{x} - 1\right) = 2$, then find
 - $x^{38} + \frac{1}{x^{38}}$
 - $x^{53} + \frac{1}{x^{53}}$
 - $x^{84} + x^{66} + x^{30} + x^{18} + x^{12} + 3$
 - $x^{75} + \frac{1}{x^{75}}$
- If $x^2 - 7x + 13 = 0$, then $(x-3)^{22} + \frac{1}{(x-3)^{22}}$
 - 3
 - 1
 - 1
 - 2
- If $a + \frac{1}{a} = -1$, then $(1 - a + a^2)(1 + a - a^2)$?
 - 3
 - 2
 - 1
 - 4
- If $\frac{x}{2} + \frac{3}{x} = 1$, then x^3 ?
 - 27
 - 27
 - 20
 - 0
- If $\frac{x}{4} + 1 = \frac{-4}{a}$, then $a^5 - 64a^2 + 1$
 - 1
 - 2
 - 3
 - 4
- If $49x^2 + 29 = 49x - 20$, then $x^{49} + \frac{1}{x^{49}}$
 - 2
 - 1
 - 0
 - None
- If $x + \frac{1}{x} = 1$ and $y + \frac{1}{y} = -1$ then $x^{6y} + y^{3x}$?
 - 0
 - 3
 - 2
 - None
- If $x^{\frac{1}{4}} + \frac{1}{x^{\frac{1}{4}}} = 1$, then $x^{128} + \frac{1}{x^{128}}$
 - 1
 - 1
 - 2
 - 3
- If $x(x-1) = -1$, then $x^4 - 6x^3 + 9x^2 + 8x + 11$
 - 7
 - 0
 - 8
 - 5



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ALGEBRA

ADDITION AND SUBTRACTION

Part
14

1. If $\frac{1}{x+1} + \frac{2}{y+2} + \frac{1011}{z+1011} = 1$, then $\frac{x}{x+1} + \frac{y}{y+2} + \frac{z}{z+1011} = ?$
- (A) 1 (B) 3
(C) 4 (D) 2
2. If $\frac{a}{1+a} + \frac{b}{1+b} + \frac{c}{1+c} = 1$, then $\frac{1}{1+a} + \frac{1}{1+b} + \frac{1}{1+c} = ?$
- (A) 2 (B) 0
(C) 4 (D) 5
3. If $\frac{a}{1-2a} + \frac{b}{1-2b} + \frac{c}{1-2c} = 1$, then $\frac{1}{1-2a} + \frac{1}{1-2b} + \frac{1}{1-2c} = ?$
- (A) 3 (B) 4
(C) 5 (D) 0
4. If $\frac{a}{5+3a} + \frac{b}{5+3b} + \frac{c}{5+3c} = 6$, then $\frac{1}{5+3a} + \frac{1}{5+3b} + \frac{1}{5+3c} = ?$
- (A) 3 (B) -3
(C) 2 (D) None
5. If $\frac{a}{x-1} + \frac{4b}{5+3b} + \frac{9c}{z-3c} = 6 - a$, then $\frac{ax}{x-1} + \frac{2y}{y-2b} + \frac{3z}{z-3c} = ?$
- (A) 10 (B) 12
(C) 15 (D) 11
6. If $\frac{1}{x+1} + \frac{2}{x+2} + \frac{3}{x+3} + \dots + \frac{1005}{x+1005} = 1200$ find $\frac{x}{x+1} + \frac{x}{x+2} + \frac{x}{x+3} + \dots + \frac{x}{x+1005} = ?$
- (A) 200 (B) -195
(C) 295 (D) 120



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ALGEBRA

FORMULA BASED

**Part
15**

- If $a = 1001$, $b = 1002$, $c = 1003$, find $a^2 + b^2 + c^2 - ab - bc - ca$.
(A) 0 (B) 3
(C) 2 (D) 1
- If $a = 94$, $b = 95$, $c = 96$, then find out $a^3 + b^3 + c^3 - 3abc$.
(A) 840 (B) 855
(C) 870 (D) 955
- If $a + b + c = 0$, then find out the value of $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$.
(A) 3 (B) 0
(C) 1 (D) 2
- If $A = x - y$, $B = y - z$, $C = z - x$, then $\frac{(x - y)^3 + (y - z)^3 + (z - x)^3}{(x - y)(y - z)(z - x)} = ?$
(A) 2 (B) 0
(C) 3 (D) 1
- If $a + b + c = 6$, then $(a - 1)^3 + (b - 2)^3 + (c - 3)^3 = ?$
(A) $3(a - 1)(b - 2)(c - 3)$
(B) 3
(C) $(a - 1)(b - 2)(c - 3)$
(D) 1
- $\frac{(1.2)^3 + (.8)^3 + (.7)^3 - 2.016}{(1.35)[(1.2)^2 + (.8)^2 + (.7)^2 - .96 - .84 - .56]} = ?$
(A) 1 (B) 2
(C) 3 (D) 0
- $\frac{(x^2 - y^2)^3 + (y^2 - z^2)^3 + (z^2 - x^2)^3}{(x - y)^3 + (y - z)^3 + (z - x)^3} = ?$
(A) $(x + y)(y + z)(z + x)$
(B) 3
(C) $3xyz$
(D) $3(x + y)(y + z)(z + x)$
- If $a = 4.965$, $b = 2.343$, $c = 2.622$, then find out the value of $a^3 - b^3 - c^3 - 3abc$.
(A) 1 (B) 3
(C) 2 (D) 0
- If $p^3 + q^3 + r^3 - 3pqr = 4$, $a = q + r$, $b = r + p$, $c = p + q$, then find out the value of $a^3 + b^3 + c^3 - 3abc$.
(A) 4 (B) 8
(C) 3 (D) 2
- If $x^3 + y^3 + z^3 = 3(1 + xyz)$, $P = y + z - x$, $Q = z + x - y$ and $R = x + y - z$, then what is the value of $P^3 + Q^3 + R^3 - 3PQR$?
(A) 9 (B) 8
(C) 12 (D) 6
- If $x + y + z = 22$, $xy + yz + zx = 35$, then find out the value of $(x - y)^2 + (y - z)^2 + (z - x)^2$?
(A) 748 (B) 758
(C) 700 (D) 840
- If $x + y + z = 11$, $x^2 + y^2 + z^2 = 113$ and $x^3 + y^3 + z^3 = 881$, then the value of $\sqrt[3]{xyz}$ is:
(A) -8 (B) 6
(C) 8 (D) -6
- If $a - \frac{1}{a} = b$, $b - \frac{1}{b} = c$, $c - \frac{1}{c} = a$, then find out the value of $\frac{1}{ab} + \frac{1}{bc} + \frac{1}{ca}$.
(A) 3 (B) 0
(C) -3 (D) 1
- If $x^2 + y^2 + z^2 = xy + yz + zx$, then find $\frac{3x^4 + 4y^4 + 8z^4}{x^2y^2 + y^2z^2 + x^2z^2}$?
(A) 1 (B) 5
(C) 4 (D) 2
- If $x + y + z = 4\sqrt{6}$ and $x^2 + y^2 + z^2 = 32$, then find out the value $x : y : z$.
(A) 1 : 2 : 3 (B) 1 : 1 : 2
(C) 1 : 2 : 4 (D) 1 : 1 : 1

16. If $(x+y)^{\frac{1}{3}} + (y+z)^{\frac{1}{3}} = -(z+x)^{\frac{1}{3}}$, then find out the value of $x^3+y^3+z^3$.

(A) $\frac{1}{8}xyz$

(B) $\frac{27}{8}(x+y)(y+z)(z+x)$

(C) $\frac{3}{8}(x+y)(y+z)(z+x)$

(D) $3xyz$

17. If x, y, z are real numbers. $x^3+y^3+z^3=13$, $x+y+z=1$, $xyz=1$, find $xy+yz+zx$.

(A) -1

(B) 0

(C) 3

(D) -3

18. If $x+y+z=1$, $x^2+y^2+z^2=2$, $x^3+y^3+z^3=3$, then $xyz=?$

(A) $\frac{1}{3}$

(B) $\frac{1}{6}$

(C) 1

(D) 6

19. If $x^2+y^2+z^2=133$, $xy+yz+zx=114$ and $xyz=216$, then find out the value of $x^3+y^3+z^3$.

(A) 942

(B) 1009

(C) 999

(D) 948

20. If $x+y+z=19$, $x^2+y^2+z^2=133$ and $xz=y^2$, then find out the difference between z and x .

(A) 5

(B) 3

(C) 6

(D) 4

21. If $(5x-3)^3 + (2x+5)^3 + 27(4-3x)^3 = 9(3-5x)(2x+5)(3x-4)$. Find out $2x+1$

(A) 13

(B) -13

(C) 15

(D) -15

22. If $(3x-1)^3 + (4x-3)^3 + (2x+1)^3 = 3$

$(3x-1)(4x-3)(2x+1)$ and $x \neq \frac{1}{3}$ find out the value of x .

(A) $\frac{1}{2}$

(B) 2

(C) $\frac{1}{4}$

(D) 1



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ALGEBRA

VALUE PUTTING

Part
16

1. If $p, q, r = 1$, then $\frac{1}{1+p+q^{-1}} + \frac{1}{1+q+r^{-1}} + \frac{1}{1+r+p^{-1}} ?$
 (A) 2 (B) 1
 (C) 3 (D) 0
2. If $a+b+c = 0$, then $\frac{1}{a^2+b^2-c^2} + \frac{1}{b^2+c^2-a^2} + \frac{1}{c^2+a^2-b^2} ?$
 (A) 0 (B) 1
 (C) 2 (D) 3
3. If $\frac{a}{b+c} + \frac{b}{c+a} + \frac{c}{a+b} = 1$, find $\frac{a^2}{b+c} + \frac{b^2}{c+a} + \frac{c^2}{a+b} ?$
 (A) 1 (B) 3
 (C) 4 (D) 0
4. If $\frac{L}{M} + \frac{M}{N} + \frac{N}{L} = 0$, then $\frac{NL}{M^2} + \frac{M^2}{LN} - \frac{N^3}{L^3} ?$
 (A) -2 (B) 0
 (C) 2 (D) None
5. If $ab+bc+ca=0$, find $\frac{1}{a^2-bc} + \frac{1}{b^2-ca} + \frac{1}{c^2-ab} ?$
 (A) 3 (B) 1
 (C) $x+y+z$ (D) 0
6. If $a+b+c = 2S$, then $\frac{(S-a)^2+(S-b)^2+(S-c)^2+S^2}{a^2+b^2+c^2} ?$
 (A) 0 (B) 1
 (C) 2 (D) $a^2+b^2+c^2$
7. If $a+b+c = 0$, then $\frac{a^2+b^2+c^2}{(a-b)^2+(b-c)^2+(c-a)^2} ?$
 (A) 1 (B) 3
 (C) $\frac{1}{3}$ (D) 0
8. If $a+b+c = 0$, then $\frac{a^2}{2a^2+bc} + \frac{b^2}{2b^2+ca} + \frac{c^2}{2c^2+ab} ?$
 (A) 0 (B) 1
 (C) 3 (D) 2
9. If $a+b+c = 0$, then $\frac{1}{(a+b)(b+c)} + \frac{1}{(a+c)(c+b)} + \frac{1}{(a+c)(b+a)} ?$
 (A) 0 (B) 1
 (C) 4 (D) $\frac{1}{2}$
10. If $x+y+z = 0$, then $\frac{x^2+y^2+z^2}{x^2-yz} ?$
 (A) 2 (B) 4
 (C) 3 (D) 0
11. If $x = a + \frac{1}{a}$ and $y = a - \frac{1}{a}$, then $\sqrt{x^4+y^4-2x^2y^2} ?$
 (A) 4 (B) $\frac{8}{a^2}$
 (C) 8 (D) $16a^2$
12. If $2x = a+3$, find $8x^3-18ax ?$
 (A) a^3+27 (B) a^3-27
 (C) a^3+25 (D) a^3-36

13. If $x + y = 2z$, then $\frac{x}{x-z} + \frac{y}{y-z}$.

- (A) 1 (B) 0
(C) 2 (D) None

14. Find $\frac{1}{a^2 + ax + x^2} - \frac{1}{a^2 - ax + x^2} + \frac{2ax}{a^4 + a^2x^2 + x^4}$?

- (A) 2 (B) 1
(C) -1 (D) 0

15. Find $\frac{1}{a-b} - \frac{1}{a+b} - \frac{2b}{a^2+b^2} - \frac{4b^3}{a^4+b^4} - \frac{8b^7}{a^8-b^8}$.

- (A) $a+b$ (B) $a-b$
(C) 1 (D) 0

16. If $p-2q=4$, find $p^3-8q^3-24pq-64$.

- (A) 1 (B) 3
(C) 2 (D) 0

17. If $2x = \sqrt{a} + \frac{1}{\sqrt{a}}$, find $\frac{\sqrt{x^2-1}}{x-\sqrt{x^2-1}}$?

- (A) $\frac{a-1}{2}$ (B) $\frac{a+1}{2}$
(C) $\frac{a}{2}$ (D) $\frac{a-2}{2}$

18. If $a = \frac{1+x}{2-x}$, find $\frac{1}{a+1} + \frac{2a+1}{a^2-1}$.

- (A) $\frac{(1+x)(2+x)}{2x-1}$
(B) $\frac{(1-x)(2-x)}{x+1}$
(C) $\frac{(1+x)(2-x)}{2x-1}$
(D) $\frac{(1-x)(2-x)}{2x+1}$

19. If $a+b+c = 6$ & $ab+bc+ca=11$ find $bc(b+c)+ca(c+a)+ab(a+b)+3abc$.

- (A) 55 (B) 0
(C) 66 (D) 60

20. If $x = \sqrt[3]{a+\sqrt{a^2+b^3}} + \sqrt[3]{a-\sqrt{a^2+b^3}}$, find x^3+3bx .

- (A) 0 (B) 1
(C) $2a$ (D) $4a$

21. $\sqrt[3]{a} + \sqrt[3]{b} = \sqrt[3]{c}$, then find out $(a+b-c)^3+27abc$.

- (A) 0 (B) 2
(C) 1 (D) 4

22. If $a^2+b^2=c^2$, then $\frac{a^6+b^6-c^6}{a^2b^2c^2}$?

- (A) 3 (B) 0
(C) 1 (D) -3

23. If $y = \frac{2-x}{1+x}$, then $\frac{1}{y+1} + \frac{2y+1}{y^2-1}$?

- (A) $\frac{(1+x)(2-x)}{2x-1}$ (B) $\frac{(1-x)(2+x)}{x-1}$
(C) $\frac{(1+x)(2-x)}{1-2x}$ (D) $\frac{(1+x)(1-2x)}{2-x}$

24. If $\left[\sqrt{a^2+b^2+ab}\right] + \left[\sqrt{a^2+b^2-ab}\right] = 1$, then $(1-a^2)(1-b^2)$.

- (A) $\frac{1}{4}$ (B) $\frac{4}{7}$
(C) $\frac{5}{4}$ (D) $\frac{3}{4}$

25. If $x^3 + \frac{3}{x} = 4(a^3+b^3)$ and $3x + \frac{1}{x^3} = 4(a^3-b^3)$, then find out the value a^2-b^2 .

- (A) 0 (B) 1
(C) 3 (D) 2



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ALGEBRA

(C&D)

Part
17

- If $\frac{x+y}{x-y} = \frac{3}{1}$, then find out the value of $\frac{x}{y} = ?$
 - 3
 - 2
 - 1
 - 5
- If $\frac{3x+2y}{3x-2y} = \frac{4}{3}$, then find out the value of $\frac{x}{y}$.
 - $\frac{7}{3}$
 - $\frac{14}{3}$
 - $\frac{3}{14}$
 - None
- If $\frac{\sqrt{x+4} + \sqrt{x-4}}{\sqrt{x+4} - \sqrt{x-4}} = 2$, then find $x = ?$
 - 2.4
 - 3.2
 - 4
 - 5
- $\alpha = \frac{\sqrt{x+2} + \sqrt{x-2}}{\sqrt{x+2} - \sqrt{x-2}}$, then find out the value $\alpha^2 - \alpha x$.
 - 1
 - 2
 - 2
 - 1
- If $x = \frac{\sqrt{m+3n} + \sqrt{m-3n}}{\sqrt{m+3n} - \sqrt{m-3n}}$, then $3nx^2 + 3n = ?$
 - $2mx$
 - mx
 - 0
 - 1
- If $x = \frac{\sqrt[3]{m+1} + \sqrt[3]{m-1}}{\sqrt[3]{m+1} - \sqrt[3]{m-1}}$, then find out the value of $x^3 - 3mx^2 + 3x - m$.
 - 0
 - 1
 - 3
 - None
- If $\frac{x^3+3x}{3x^2+1} = \frac{189}{61}$, then find out the value of x ?
 - 3
 - 5
 - 4
 - 9
- If $(a+b) : \sqrt{ab} = 4 : 1$, $a > b$, then $a : b = ?$
 - $\frac{1+\sqrt{2}}{1-\sqrt{2}}$
 - $\frac{3}{2}$
 - $\frac{2+\sqrt{3}}{2-\sqrt{3}}$
 - $\frac{3+\sqrt{4}}{3-\sqrt{4}}$
- If $x = \frac{a-b}{a+b}$, $y = \frac{b-c}{b+c}$, $z = \frac{c-a}{c+a}$ find $\frac{1+x}{1-x} \times \frac{1+y}{1-y} \times \frac{1+z}{1-z} = ?$
 - 1
 - $\frac{a}{b}$
 - $\frac{b}{a}$
 - None
- If $a+b=1$, $c+d=1$ & $a-b = \frac{d}{c}$, then $c^2 - d^2 = ?$
 - 2
 - $\frac{a}{b}$
 - $\frac{b}{a}$
 - a
- If $x = \frac{4\sqrt{15}}{\sqrt{5}+\sqrt{3}}$, then find out the value of $\frac{x+\sqrt{12}}{x-\sqrt{12}} + \frac{x+\sqrt{20}}{x-\sqrt{20}} = ?$
 - 3
 - 2
 - 0
 - None

12. If $x = \frac{2\sqrt{24}}{\sqrt{8}+\sqrt{3}}$, then find $\frac{x+\sqrt{3}}{x-\sqrt{3}}$

(A) 2

(B) $\sqrt{\frac{2}{3}}$

$+\frac{x+\sqrt{8}}{x-\sqrt{8}}=?$

(C) $\sqrt{\frac{3}{2}}$

(D) $\frac{1}{\sqrt{6}}$

(A) 2

(B) 3

(C) 1

(D) 5

13. If $x = \frac{\sqrt{6}}{\sqrt{3}+\sqrt{2}}$, then $\frac{x+\sqrt{3}}{x-\sqrt{3}} - \frac{x+\sqrt{2}}{x-\sqrt{2}}=?$

14. If $\frac{8x^3+6x}{12x^2+1} = \frac{728}{603}$, then $6x+7=?$

(A) 15

(B) 12

(C) 19

(D) 17



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ALGEBRA**WHOLE SQUARE CONCEPT****Part
18**

1. Find out the value of $\sqrt{x}$ for all functions.

(i) $x = 7 + 4\sqrt{3}$ (ii) $x = 13 - 4\sqrt{3}$

(iii) $x = 52 + 30\sqrt{3}$ (iv) $x = 38 + 5\sqrt{3}$

2. If $\sqrt{86 - 60\sqrt{2}} = a - b\sqrt{2}$, then find out the value of $\sqrt{a^2 + b^2} = ?$

(A) 8.2 (B) 7.2

(C) 7.8 (D) 8.4

3. $\sqrt{-\sqrt{3} + \sqrt{3 + 8\sqrt{7 + 4\sqrt{3}}}}$ solve it.

(A) 2 (B) 1

(C) 4 (D) 7

4. $\frac{6^2 + 7^2 + 8^2 + 9^2 + 10^2}{\sqrt{7 + 4\sqrt{3}} - \sqrt{4 + 2\sqrt{3}}}$ solve it.

(A) 300 (B) 450

(C) 330 (D) 430

5. If $x = 5 - \sqrt{21}$, then find out the value of

$$\frac{\sqrt{x}}{\sqrt{32 - 2x} - \sqrt{21}}$$

(A) $\frac{\sqrt{5} - \sqrt{3}}{\sqrt{2}}$ (B) $\frac{\sqrt{7} - \sqrt{3}}{\sqrt{2}}$

(C) $\frac{\sqrt{5} - \sqrt{3}}{\sqrt{2}}$ (D) $\frac{\sqrt{7} - \sqrt{3}}{\sqrt{2}}$

6. If $x = \frac{\sqrt{3}}{2}$, then find out the value of

$$\frac{\sqrt{1+x} + \sqrt{1-x}}{\sqrt{1+x} - \sqrt{1-x}} = ?$$

(A) $\sqrt{3}$

(B) 1

(C) $\sqrt{2}$

(D) None

7. If $x = \frac{2\sqrt{10}}{7}$, then find out the value

$$\frac{\sqrt{1+x} + \sqrt{1-x}}{\sqrt{1+x} - \sqrt{1-x}} = ?$$

(A) $\frac{\sqrt{5}}{\sqrt{2}}$

(B) $\frac{\sqrt{2}}{\sqrt{5}}$

(C) $\frac{\sqrt{5}}{\sqrt{7}}$

(D) None

8. The value of $\sqrt{28 + 10\sqrt{3}} - \sqrt{7 - 4\sqrt{3}}$ is closest to:

(A) 5.8

(B) 6.1

(C) 6.5

(D) 7.2

9. If $x = \sqrt{1 + \frac{\sqrt{3}}{2}} - \sqrt{1 - \frac{\sqrt{3}}{2}}$, then the value

of $\frac{\sqrt{2-x}}{\sqrt{2+x}}$.

(A) 1.2

(B) 1.4

(C) 0.12

(D) 0.17



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ALGEBRA

(POWER 5 AND 7)

Part
19

1. If $x + \frac{1}{x} = 5$, then find the value of $x^5 + \frac{1}{x^5} = ?$
- (A) 2520 (B) 2525
(C) 2530 (D) 3535
2. If $x^5 + \frac{1}{x^5} = 724$, then find out the value of $x + \frac{1}{x} = ?$
- (A) 4 (B) 6
(C) 3 (D) 5
3. If $x^6 + \frac{1}{x^6} = 3$, then find out the value of $x^{30} + \frac{1}{x^{30}} = ?$
- (A) 133 (B) 123
(C) 132 (D) None
4. If $x + \frac{1}{x} = 3$, then find out the value of $x^7 + \frac{1}{x^7} = ?$
- (A) 843 (B) 832
(C) 806 (D) 854
5. If $x - \frac{1}{x} = 3$, then find out $x^7 - \frac{1}{x^7} = ?$
- (A) 4287 (B) 4285
(C) 4243 (D) 4298
6. If $x + \frac{1}{x} = 4$, then $x^7 - \frac{1}{x^7} = ?$
- (A) $5821\sqrt{3}$ (B) $5823\sqrt{3}$
(C) $5822\sqrt{3}$ (D) None
7. If $x^4 + \frac{1}{x^4} = 62$, find out the value of $x^6 + \frac{1}{x^6} = ?$
- (A) 468 (B) 442
(C) 488 (D) None
8. If $x + \frac{1}{x} = 3$, then find out the value of $x^6 - \frac{1}{x^6} = ?$
- (A) $140\sqrt{5}$ (B) $144\sqrt{5}$
(C) $142\sqrt{5}$ (D) $136\sqrt{5}$
9. If $x^4 - \frac{1}{x^4} = 21\sqrt{5}$, then find out the value of $\frac{1+x+x^2+x^3+x^4+x^5+x^6+x^7+x^8+x^9+x^{10}}{x^5} = ?$
- (A) 188 (B) 198
(C) 192 (D) 162
10. If $x^2+13x+39=0$, then $(x+8)^5 + \frac{1}{(x+8)^5} = ?$
- (A) 393 (B) 396
(C) 392 (D) 394



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ALGEBRA

($X+1/X=2$)

Part
20

1. If $x + \frac{1}{x} = 2$, then find out the value of $x^{19} + \frac{1}{x^{19}} = ?$
- (A) 3 (B) 2
(C) 4 (D) 5
2. If $x + \frac{1}{x-3} = 5$, then find out the value of $(x-3)^3 + \frac{1}{(x-3)^2} = ?$
- (A) 8 (B) 2
(C) 7 (D) 6
3. If $a+b = 10$ and $\sqrt{\frac{b}{a}} - 13 = -\sqrt{\frac{b}{a}} - 11$, then what is the value of $4a^2 + 5b^2 + 3ab = ?$
- (A) 750 (B) 600
(C) 450 (D) 300
4. If $\frac{a^2}{b^3} + \frac{b^3}{a^2} = -2$, then find out the value of $a^6 + b^9 + 3a^2b^3 (a^2 + b^3) = ?$
- (A) 0 (B) 1
(C) 2 (D) 5
5. If $(4x-7)(9-4x) = 1$, find $(x-3)^3 + \frac{1}{(x-3)^3}$
- (A) -2 (B) 2
(C) 1 (D) 0
6. If $x + \frac{1}{x + \frac{3}{4}} = \frac{-11}{4}$, then $\left(x + \frac{7}{4}\right)^4 + \frac{1}{\left(x + \frac{11}{4}\right)^2}$
- (A) 0 (B) 1
(C) 2 (D) 3



Updated

By Pushpendra Sir

ALGEBRA (MAX & MIN)

Part
21

1. Find out minimum value of $x^2 - 2x + 4$.
(A) 2 (B) 3
(C) 4 (D) 5
2. Find out minimum value of $(x-3)(x-2)$.
(A) $-\frac{1}{4}$ (B) $\frac{1}{4}$
(C) $\frac{3}{4}$ (D) $-\frac{3}{4}$
3. Find out maximum value of $13 - 4x - x^2$.
(A) 16 (B) 17
(C) 18 (D) None
4. If $a+b=10$, then find maximum value of ab but give a, b are positive real no.
(A) 20 (B) 30
(C) 25 (D) 40
5. If $a \cdot b = 16$, find out minimum value of $(a+b)$.
(A) 15 (B) 0
(C) 8 (D) None
6. If x is a positive real no. then find out the minimum value of $\left(x + \frac{1}{x}\right)$.
(A) 3 (B) 2
(C) 0 (D) None
7. If x is a positive real no, then find out maximum value of $\frac{x^4}{x^8 + 1}$.
(A) 2 (B) 3
(C) 4 (D) 5
8. If $(x > \sqrt{3})$, $f(x) = x^2 + \frac{1}{x^2 - 3} - 4$, find out minimum value.
(A) 1 (B) 2
(C) -2 (D) -1
9. If x, y, z are positive real numbers, then find out minimum value of $\left(\frac{x}{y} + \frac{y}{z} + \frac{z}{x}\right)$.
(A) 2 (B) 3
(C) 4 (D) 5
10. $\frac{x^2(y+z) + y^2(z+x) + z^2(x+y)}{xyz}$ find minimum value $x \neq y \neq z$, x, y, z are positive real no.
(A) 5 (B) 4
(C) 7 (D) 6
11. If $a+b+c = 15$, then find out maximum value of abc .
(A) 120 (B) 100
(C) 125 (D) None
12. If $(x-7)(y-10)(z-12) = 1000$, then find out minimum value of $(x+y+z)$.
(A) 49 (B) 59
(C) 69 (D) 70



Updated

By Pushpendra Sir

ALGEBRA

BREAK IN TWO FACTORS

Part
22

1. If $x^2 - xy + y^2 = 13$ & $x^4 + y^4 + x^2y^2 = 312$, then find out the value of $x^2 + y^2 + xy$?
- (A) 23 (B) 24
(C) 25 (D) 27
2. If $x^2 - xy + y^2 = 9$ & $x^4 + y^4 + x^2y^2 = 189$, then $\frac{x^2}{y^2} + \frac{y^2}{x^2} = ?$
- (A) $\frac{15}{4}$ (B) $\frac{17}{4}$
(C) $\frac{19}{4}$ (D) None
3. If $x^4 + x^2y^2 + y^4 = \frac{21}{256}$ & $x^2 + xy + y^2 = \frac{3}{16}$, find $x + y$.
- (A) $\frac{1}{3}$ (B) $\frac{1}{5}$
(C) $\frac{1}{2}$ (D) $\frac{1}{4}$
4. If $a^4 + a^2b^2 + b^4 = \frac{39}{512}$ & $a^2 + ab + b^2 = \frac{13}{32}$, find ab .
- (A) $\frac{7}{64}$ (B) $\frac{9}{64}$
(C) 1 (D) None
5. If $a + b + \sqrt{ab} = 39$, then $\frac{a + b + \sqrt{ab}}{a^2 + b^2 + ab} = ?$
- (A) $\frac{1}{39}$ (B) 1
(C) $\frac{5}{39}$ (D) 0
6. $x + 2 + y + 3 + \sqrt{(x + 2)(y + 3)} = 39$ & $(x + 2)^2 + (y + 3)^2 + (x + 2)(y + 3) = 741$ find $x = ?$
- (A) 21, 2 (B) 19, 3
(C) 23, 2 (D) None



Updated

By Pushendra Sir

ALGEBRA

MISCELLANEOUS

**Part
23**

1. $3a + \frac{2}{b} = 1$ and $b + \frac{1}{c} = 2$, then find the value of abc .
(A) 0 (B) -3
(C) $-\frac{1}{3}$ (D) 1
2. If $a+b+c=4$, $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 3$, then $\frac{a}{b} + \frac{b}{a} + \frac{c}{a} + \frac{a}{c} + \frac{b}{c} + \frac{c}{b}$?
(A) 6 (B) 7
(C) 8 (D) 9
3. If $(x+1)(x+2) + \frac{1}{x(x-1)} = 0$, then $x^2+x=?$
(A) 4 (B) 1
(C) 9 (D) 0
4. If $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = \frac{1}{a+b+c}$, where $a+b+c \neq 0$ & $abc \neq 0$ then find out the value of $(a+b)(b+c)(c+a)$?
(A) 0 (B) 1
(C) 2 (D) 4
5. If $\frac{x+\sqrt{x^2-1}}{x-\sqrt{x^2-1}} + \frac{x-\sqrt{x^2-1}}{x+\sqrt{x^2-1}} = 14$, find out x ?
(A) ± 3 (B) ± 4
(C) ± 2 (D) None
6. If $\frac{L}{M} + \frac{M}{N} + \frac{N}{L} = 0$, then $\frac{NL}{M^2} + \frac{M^2}{LN} - \frac{N^3}{L^3} = ?$
(A) -3 (B) -2
(C) 1 (D) None
7. If $x = 3 + 3^{\frac{1}{3}} + 3^{\frac{2}{3}}$, then $x^3 - 9x^2 + 18x = ?$
(A) 10 (B) 12
(C) 13 (D) None
8. If $x = 5 - 5^{\frac{2}{3}} + 5^{\frac{1}{3}}$, then $x^3 - 15x^2 + 60x = ?$
(A) 170 (B) 150
(C) 180 (D) 140
9. If $\sqrt{13x^3 - 14x + 29} + \sqrt{13x^3 - 14x - 21} = 10$
 $\sqrt{13x^3 - 14x + 29} - \sqrt{13x^3 - 14x - 21} = ?$
(A) 4 (B) 3
(C) 2 (D) 5
10. If $a^4 + a^2b^2 + b^4 = 12$ and $a^2 + ab + b^2 = 4$, then $ab = ?$
(A) 1 (B) 3
(C) $\frac{1}{3}$ (D) $\frac{1}{2}$
11. If $\frac{12x^2 - 27x + 28}{4x^2 - 9x + 9} = 3.2$, then $x^3 + \frac{1}{x^3} = ?$
(A) $\frac{297}{64}$ (B) $\frac{293}{64}$
(C) $\frac{397}{64}$ (D) None
12. If $(a+b+4)[ab+4(a+b)] - 4ab = 0$, and $a \neq 4$, $b \neq 4$, then $\left[\frac{1}{(a+b+4)^{117}} - 2^{-234} \right]$ is
(A) $\frac{-1}{(a+b+4)^{117}}$ (B) $\frac{1}{2^{117}}$
(C) $\frac{-1}{2^{234}}$ (D) 0
13. If $\sqrt{\frac{1+x}{x}} - \sqrt{\frac{x}{1+x}} = \frac{1}{\sqrt{6}}$, then $x = ?$
(A) -2 (B) 3
(C) 2 (D) 1
14. If $a + \frac{1}{b} = b + \frac{1}{c} = c + \frac{1}{a}$, $a \neq b \neq c$, find $abc = ?$
(A) ± 1 (B) ± 2
(C) ± 3 (D) 0

15. If $\frac{xy}{x+y}=a$, $\frac{xz}{x+z}=b$, $\frac{yz}{y+z}=c$, then find out the value of x .
- (A) $\frac{2abc}{ab+bc+ca}$ (B) $\frac{2abc}{bc+ac-ab}$
 (C) $\frac{2abc}{ab+bc-ca}$ (D) None
16. If $\frac{b-c}{a} + \frac{a+c}{b} + \frac{a-b}{c} = 1$ & $a-b+c \neq 0$, then find out the relation between a, b, c .
- (A) $\frac{1}{a} = \frac{1}{b} + \frac{1}{c}$ (B) $\frac{1}{b} = \frac{1}{a} + \frac{1}{c}$
 (C) $\frac{1}{a} = \frac{1}{b} - \frac{1}{c}$ (D) None
17. $x^6 - 18x^5 + 18x^4 - 18x^3 + 18x^2 - 18x + 18$ is what given ($x=17$)
- (A) 0 (B) 1
 (C) 2 (D) 3
18. If $x^3 - 4x^2 + 19 = 6(x-1)$, then what is the value of $\left[x^2 + \left(\frac{1}{x-4} \right) \right]$?
- (A) 3 (B) 5
 (C) 6 (D) 8
19. Given that x, y, z are positive real numbers. If $(a+b)^2 - z^2 = 8$, $(b+c)^2 - a^2 = 10$ and $(a+c)^2 - b^2 = 7$, then $(x+y+z)$ is equal to:
- (A) 6 (B) 8
 (C) 7 (D) 5
20. $a^2 - \frac{15}{a} = 4$ and $a \neq 3$, find $a(a+1)(a+2)(a+3) = ?$
- (A) 15 (B) 21
 (C) 27 (D) 12
21. If $x = a + \frac{1}{a}$ and $y = a - \frac{1}{a}$ then $\sqrt{x^4 + y^4 - 2x^2y^2} = ?$
- (A) $16a^2$ (B) 8
 (C) $\frac{8}{a^2}$ (D) 4
22. If $xy + x + y = 23$, $xz + z + x = 41$, $yz + y + z = 27$, then find $z = ?$
- (A) 5 (B) 4
 (C) 6 (D) 8
23. If $\sqrt{a^2 + b^2 + ab} + \sqrt{a^2 + b^2 - ab} = 1$, then what is the value of $(1-a^2)(1-b^2) = ?$
- (A) $\frac{1}{4}$ (B) $\frac{4}{7}$
 (C) $\frac{5}{4}$ (D) $\frac{3}{4}$
24. If $a^3 - b^3 = 416$ and $a - b = 8$, then $(a+b)^2 - ab = ?$
- (A) 52 (B) 42
 (C) 38 (D) 32
25. If $x^4 - \frac{1}{x^4} = 21\sqrt{5}$, then find out the value of $\frac{1+x+x^2+x^3+x^4+x^5+x^6+x^7+x^8+x^9+x^{10}}{x^5} = ?$
- (A) 188 (B) 288
 (C) 310 (D) None
26. If $p^4 + p^{-4} = 119$, ($p > 0$), then the value of $(2p-3)^2$ is:
- (A) 14 (B) 13
 (C) 12 (D) 10
27. If $x = \frac{\sqrt{5}+1}{\sqrt{5}-1}$, then what is the value of $x^3 - \frac{1}{x^3} = ?$
- (A) 3 (B) 4
 (C) 2 (D) 1
28. If $a^2 + b^2 = 41$, and $a + b = 9$, then find out the value a ?
- (A) 4 (B) 3
 (C) 2 (D) 5
29. If $\frac{x^2}{by+cz} = \frac{y^2}{ax+cz} = \frac{z^2}{ax+by} = 2$, then $\frac{a}{x+2a} + \frac{b}{y+2b} + \frac{c}{z+2c} = ?$
- (A) $\frac{1}{3}$ (B) $\frac{1}{2}$
 (C) $\frac{1}{4}$ (D) None

30. If $\frac{x^2}{by+cz} = \frac{y^2}{ax+cz} = \frac{z^2}{ax+by} = 1$, then $\frac{a}{x+a} + \frac{b}{y+b} + \frac{c}{z+c} = ?$
- (A) 0 (B) 1
(C) 2 (D) 3
31. If $\frac{x}{a} = \frac{y}{b} = \frac{z}{c}$, then which is correct:
- (A) $\frac{x+y-z}{a+b+c}$ (B) $\frac{x-y-z}{a-b+c}$
(C) $\frac{x+y+z}{a+b+c}$ (D) $\frac{x+y+z}{a-b-c}$
32. If $\frac{x}{b+c} = \frac{y}{c+a} = \frac{z}{a+b}$, then which is correct:
- (A) $\frac{x-y}{b-a} = \frac{y-z}{c-b} = \frac{z-x}{a-c}$
(B) $\frac{x}{a} = \frac{y}{b} = \frac{z}{c}$
(C) $\frac{x-y}{a} = \frac{y-z}{b} = \frac{z-x}{c}$
(D) None
33. If $\frac{a+b}{am+bn} = \frac{b+c}{mb+cn} = \frac{c+a}{mc+na}$, then which is correct:
- (A) $\frac{1}{m+n}$ (B) $\frac{2}{m-n}$
(C) $\frac{2}{m+n}$ (D) 0
34. If $\frac{x}{a} = \frac{y}{b} = \frac{z}{c}$, then $\frac{ax-by}{(a+b)(x-y)} + \frac{by-cz}{(b+c)(y-z)} + \frac{cz-ax}{(c+a)(z-x)} = ?$
- (A) 2 (B) 1
(C) 3 (D) None
35. If $a^2+b^2=135$ and $ab=7$, ($a>0, b>0$), then the value of (a^3-b^3) is:
- (A) 1562 (B) 1408
(C) 1420 (D) 1350
36. If $x^4+x^4 = 2207$, ($x>0$), then $(x+x^{-1}) = ?$
- (A) 19 (B) 7
(C) 11 (D) 9



Updated

By Pushpendra Sir

ALGEBRA DEGREE

Part
24

1. $\frac{a^3(b-c)}{(a-b)} + \frac{b^3(c-a)}{(b-c)(b-a)} + \frac{c^3(a+b)}{(c-a)(c-b)} = ?$
- (A) abc (B) $a+b+c$
(C) $ab+bc+ca$ (D) 3
2. $\frac{a(b-c)^2}{(c-a)(a-b)} + \frac{b(c-a)^2}{(a-b)(b-c)} + \frac{c(a-b)^2}{(b-c)(c-a)} = ?$
- (A) $a+b+c$ (B) 3
(C) $a^2+b^2+c^2$ (D) abc
3. $\frac{a^3(b^2-c^2)+b^3(c^2-a^2)+c^3(a^2-b^2)}{a^2(b-c)+b^2(c-a)+c^2(a-b)} = ?$
- (A) $ab+bc+ca$ (B) 1
(C) 0 (D) $a+b+c$
4. $(x+y+z)^3 - (x+y-z)^3 - (y+z-x)^3 - (z+x-y)^3 = ?$
- (A) $8(x+y+z)$ (B) $24xyz$
(C) $12xyz$ (D) 24