ALGEBRA- 1

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1. If $a+a^2+a^3-1=0$ then find $a^3+\frac{1}{a}=?$

A) 1 B) 4 C) 2 D) 3

2. If $a^3+3a^2+9a-1=0$; then what is the value of $a^3+\left(\frac{3}{a}\right)=?$

A) 31 B) 26 C) 28 D) 24

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

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

4. If $9b^2+\frac{1}{b^2}=3$; find $27b^3+\frac{1}{b^3}=?$

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

5. If $a^3+4a^2+16a+1=0$ then find $a^3-\frac{4}{a}=?$

A) 61 B) 64 C) 62 D) 63

6. If $a^6+a^5+a^4+a^3+a^2+a+1=0$, then find $a^{21}+a^{14}=?$

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

7. If $x^2+2=2x$; then find $x^4-x^3+x^2+2=?$

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

8. If $x^4+2x^3+ax^2+bx+9$ is a perfect square, where a and b are positive real numbers, then the value of a and b are?

A) a =5, b = 6 B) a = 6, b = 7
C) a = 7, b = 6 D) a = 7, b = 8

9. If $x^4+4x^3+ax^2+bx+25$ is a perfect square, where a and b are positive real numbers, then the value of a + b?

A) 20 B) 32 C) 34 D) 42

10. If A and B are positive integers if A + B + AB = 65, find the difference between A and B ? $(A,B\leq 15)$

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

11. 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

12. If x + y = 2z, then the value of $\frac{z}{x-z}+\frac{z}{y-z}$ is

A) 0 B) –1 C) 1 D) 2

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13. If a + b + c = 0, then $\frac{1}{(a+b)(b+c)}+\frac{1}{(a+c)(b+a)}+\frac{1}{(c+a)(c+b)}=?$

A) 1 B) 0 C) –1 D) –2

14. $\frac{x}{x-a}+\frac{y}{y-b}+\frac{z}{z-c}=4$, then find $\frac{a}{x-a}+\frac{b}{y-b}+\frac{c}{z-c}=?$

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

15. $\frac{1}{1+x}+\frac{z}{y+z}+\frac{1009}{z+1009}=1$, then find $\frac{x}{1+x}+\frac{y}{y+z}+\frac{z}{z+1009}=?$

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

16. $\frac{a}{1-2a}+\frac{b}{1-2b}+\frac{c}{1-2c}=\frac{1}{2}$, then find $\frac{1}{1-2a}+\frac{1}{1-2b}+\frac{1}{1-2c}=?$

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

17. $\frac{a}{x-1}+\frac{4b}{y-2b}+\frac{9c}{z-3c}=6-a$, then find $\frac{ax}{x-1}+\frac{2y}{y-2b}+\frac{3z}{z-3c}=?$

A) 10 B) 11 C) 3 D) 7

18. $\frac{a^2-bc}{a^2+bc}+\frac{b^2-ca}{b^2+ca}+\frac{c^2-ab}{c^2+ab}=1$; then find $\frac{a^2}{a^2+bc}+\frac{b^2}{b^2+ca}+\frac{c^2}{c^2+ab}=?$

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

19. The remainder when $3x^3-2x^2y-13xy^2+10y^3$ is divided by (x – 2y) is equal to?

A) 0 B) y C) y – 5 D) y + 3

20. If $6x^3+5x^2-6x+9$ is divided by (x + 2), then the remainder is

A) 5 B) –5 C) –7 D) 7

21. If (x + 3) is factor of x^3+3x^2+4x+k, then what is the value of k?

A) 12 B) 24 C) 36 D) 72

22. The remainder when $3x^3+kx^2+5x-6$ is divided by (x + 1) is –7. What is the value of k?

A) –14 B) 14 C) –7 D) 7

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ALGEBRA- 2

1. If $a^3+b^3=5824$ and a + b = 28, then $(a-b)^2+ab$ is equal to

A) 208 B) 152 C) 180 D) 236

2. If $a^3+b^3=432$ and a + b = 12, then $(a+b)^2-3ab$ is equal to

A) 42 B) 52 C) 36 D) 38

3. If $a^3-b^3=3552$ and (a-b)=6, then $(a+b)^2-ab$ is ?

A) 618 B) 636 C) 592 D) 568

4. If $a^3-b^3=899$ and a – b = 31, then $(a-b)^2+3ab$ is equal to

A) 35 B) 31 C) 16 D) 29

5. $\left(\frac{x}{3}+\frac{y}{5}\right)^3$ B

A) $\frac{x^3}{27}+\frac{x^2y}{25}+\frac{xy^2}{25}+\frac{y^3}{125}$

B) $\frac{x^3}{27}+\frac{x^2y}{15}+\frac{xy^2}{25}+\frac{y^3}{125}$

C) $\frac{x^3}{25}+\frac{x^2y}{25}+\frac{xy^2}{25}+\frac{y^3}{125}$

D) $\frac{x^3}{17}+\frac{x^2y}{15}+\frac{xy^2}{25}+\frac{y^3}{125}$

6. $(3a-4b)^3$ is equal to

A) $27a^3-64b^3$

B) $27a^3-64b^3-108a^2+144ab^2$

C) $9a^2-24ab-16b^2$

D) $9a^2-16b^2$

7. The value of $27a^3-2\sqrt{2}b^3$ is equal to

A) $(3a-\sqrt{2}b)(9a^2-2b^2+6\sqrt{2}ab)$

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B) $\left(3a-\sqrt{2}b\right)\left(9a^2+2b^2+6\sqrt{2}ab\right)$

C) $\left(3a-\sqrt{2}b\right)\left(9a^2+2b^2+3\sqrt{2}ab\right)$

D) $\left(3a-\sqrt{2}b\right)\left(9a^2-2b^2-3\sqrt{2}ab\right)$

8. If a = 500, b = 502, c = 504, then $a^3+b^3+c^3-3abc=?$

A) 18072 B) 15060 C) 12048 D) 17040

9. If x = 5.51, y = 5.52, z = 5.57 then find $x^3+y^3+z^3-3xyz$

A) 51.46 B) 0.5146 C) 0.05146 D) 5146

10. If $1-64x^3-12x+px^2=(1-4x)^3$, then the value of p is

A) 48 B) –12 C) –48 D) 16

11. If a – b = 5 and $a^2+b^2=45$, then what is the value of ab?

A) 20 B) 10 C) 25 D) 15

12. If A + B = 12 and AB = 17, what is the value of A^3+B^3?

A) 1116 B) 1106 C) 1166 D) 1213

13. If x – y = 4 and xy = 45, then the value of x^3-y^3 is

A) 604 B) 822 C) 151 D) 82

14. If $a^2+b^2=88$ and ab = 6, (a > 0, b > 0) then what is the value of a^3+b^3 ?

A) 980 B) 1180 C) 820 D) 1000

15. If $a^2+b^2=135$ and ab = 7, (a > 0, b > 0) then the value of a^3-b^3?

A) 1562 B) 1408 C) 1420 D) 1350

16. If $a^3+b^3=218$ and a + b = 2, then the value of $\frac{1}{a}+\frac{1}{b}$ is

A) $\frac{2}{35}$ B) $-\frac{2}{35}$ C) $\frac{1}{17}$ D) $-\frac{1}{12}$

17. If x + y = 12and xy = 27, x > y, then the value of x^3-y^3 is

A) 720 B) 702 C) 724 D) 710

18. If x + y = 10 and xy = 4, then what is the value of x^4+y^4?

A) 8464 B) 8432 C) 7478 D) 6218

19. If $A=\frac{0.216+0.008}{0.36+0.04-0.12}$ and $B=\frac{0.729-0.027}{0.81+0.09+0.27}$, then what is the value of $(A^2+B^2)^2$?

A) 0.8 B) 1 C) 1.4 D) 2.2

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

A) 0.06 B) 0.02 C) 0.07 D) 0.04

21. The value of $\frac{(253)^3+(247)^3}{25.3\times25.3-624.91+24.7\times24.7}$ is 50×10^k, where the value of k

A) 4 B) 3 C) 2 D) –3

22. On simplification,

$$\frac{x^3-y^3}{x\left[(x+y)^2-3xy\right]}\div\frac{y\left[(x-y)^2+3xy\right]}{x^3+y^3}\times\frac{4xy}{(x+y)(x-y)}$$

is equal to

A) 4 B) 1 C) 1/2 D) 1/4

23. If $P=\frac{x^3+y^3}{(x-y)^2+3xy}$, $Q=\frac{(x+y)^2-3xy}{x^3-y^3}$ and $R=\frac{(x+y)^2+(x-y)^2}{x^2-y^2}$, then what is the value of

$(P \div Q)\times R=?$

A) 2xy B) $2(x^2+y^2)$ C) x^2+y^2 D) 4xy

24. If $x(x-4)=2$, then $x^6-88x^3-13=?$

A) -6 B) -4 C) -5 D) -2

25. If $2x^2-x-2=0$, then find $8x^6-13x^3-3=?$

A) – 2 B) 5 C) 9 D) 1

26. If $x(x-4)=-2$, then find $x^6-40x^3+11=?$

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

27. If $x^2+3x+9=0$, then find $\frac{x^4}{9}+\frac{27}{x}+13=?$

A) 3 B) 4 C) -3 D) 1

28. If

$$\left[8(x+y)^3-27(x-y)^3\right]\div(5y-x)=Ax^2+Bxy+Cy^2,$$

then the value of (A + B + C) is?

A) 26 B) 19 C) 16 D) 13

29. If $8(x+y)^3-(x-y)^3=(x+3y)(Ax^2+Bxy+Cy^2)$,

then the value of (A – B + C) is?

A) 10 B) 14 C) 4 D) –6

30. If

$$24\sqrt{3}x^3+2\sqrt{2}y^3=(2\sqrt{3}x+\sqrt{2}y)(Ax^2+Bxy+Cy^2)$$

then $(2A+\sqrt{6}B-C)$ is equal to

A) 10 B) 14 C) 6 D) 8

31.If $250\sqrt{2}x^3-5\sqrt{5}y^3=(5\sqrt{2}x-\sqrt{5}y)\times(Ax^2+Bxy+Cy^2)$,

then the value of $(A+C-\sqrt{10}B)$ is

A) 10 B) 5 C) $5\sqrt{2}$ D) $2\sqrt{5}$

32. If $40\sqrt{5}x^3-3\sqrt{3}y^3=(2\sqrt{5}x-\sqrt{3}y)\times(Ax^2+Bxy+Cy^2)$,

then what is the value of $\sqrt{B^2+C^2-A}$?

A) 11 B) 7 C) 8 D) 9

33. If $(27x^3-343y^3)\div(3x-7y)=Ax^2+By^2+7Cyx$, then the value of (4A – B + 5C) is

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

34. If $8x^3-27y^3=(Ax+By)(Cx^2-Dy^2+6xy)$, then (A + B + C – D) is equal to

A) – 12 B) 12 C) 9 D) 15

35. If $x^6-512y^6=(x^2+Ay^2)(x^4-Bx^2y^2+Cy^4)$, then the value of (A + B – C)?

A) – 80 B) – 72 C) 72 D) 48

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ALGEBRA 3

1. If $x+\frac{1}{x}=2$

Then find the value of

i) $x^3+x+1=?$

ii) $x^{13}+\frac{1}{x^{13}}=?$

iii) $x^{132}-\frac{1}{x^{121}}=?$

iv) $(x-2)^{11}+\frac{1}{(x-2)^{11}}=?$

2. If $m+\frac{1}{m-2}=4$

Then find the value of

i) $m^3+m^2+m+1=?$

ii) $(m-2)^{18}+\frac{1}{(m-2)^{17}}=?$

iii) $(m-4)^{17}+\frac{1}{(m-4)^{19}}=?$

iv) $(m-4)^{123}+\frac{1}{(m-4)^{234}}=?$

3. If $x+\frac{1}{x}=-2$

Then find the value of

i) $1+x+x^2+x^3+x^4=?$

ii) $x^{15}+\frac{1}{x^{19}}=?$

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iii) $(x+2)^{15}+\frac{1}{(x+2)^{15}}=?$

4. If $m+\frac{1}{m+2}=-4$

Then find the value of

i) $m^2+m+1=?$

ii) $(m+2)^{11}+\frac{1}{(m+2)^{18}}=?$

iii) $(m+4)^{13}+\frac{1}{(m+4)^{15}}=?$

5. If $x+\frac{1}{x}=\sqrt{2}$,

Then find the value of

i) $(x^{23}+x^{19}+x^{16}+4)=?$

ii) $(x^{20}+x^{12}+x^{8}+2)=?$

iii) $x^{28}+\frac{1}{x^{28}}=?$

iv) $x^{40}+\frac{1}{x^{40}}=?$

v) $x^{36}+\frac{1}{x^{48}}=?$

6. If $x+\frac{1}{x}=1$ Then find the value of

i) $x^{66}+x^{33}+x^{24}+x^{18}+x^{6}+1=?$

ii) $x^{95}+x^{92}+x^{40}+x^{37}+x^{11}+x^{8}+x^{3}+4=?$

iii) $x^{36}+\frac{1}{x^{36}}=?$

iv) $x^{15}+\frac{1}{x^{15}}=?$

v) $x^{10}+\frac{1}{x^{10}}=?$

vi) $x^{14}+\frac{1}{x^{14}}=?$

vii) If $\frac{a}{3}-1=\frac{-3}{a}$, then find $a^5+28a^2-3a+10=?$

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

7. If $x+\frac{1}{x}=-1$ Then find

i) $x^{100}-x^{97}+x^{80}-x^{77}+x^{14}-x^{11}+x^7-x^4-x^3+1=?$ 0

ii) $x^{15}+x^{12}+x^9+x^6+1=?$

iii) $x^5+x^4+1=?$

iv) $x^{18}+\frac{1}{x^{18}}=?$

v) $x^{10}+\frac{1}{x^{10}}=?$

vi) $x^{29}+\frac{1}{x^{29}}=?$

vii) $x^2+x+1=?$

8. If $x+\frac{1}{x}=\sqrt{3}$ Then find

i $x^{406}+x^{400}+x^{100}+x^{94}+x^{48}+x^{42}+x^{22}+x^{16}+7=?$

ii) $x^{72}+x^{42}+x^{36}+x^{12}+x^6+3=?$

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iii) $x^{67}+x^{43}+x^{29}+x^{17}+x^{11}+x^{6}+x^{5}+3=?$

iv) $x^{66}+\frac{1}{x^{66}}=?$

v) $x^{72}+\frac{1}{x^{72}}=?$

vi) $x^{17}+\frac{1}{x^{17}}=?$

vii) $x^{25}+\frac{1}{x^{25}}=?$

9. If $x+\frac{1}{x}=3$ Then find

i) $x^{2}+\frac{1}{x^{2}}=?$

ii) $x^{3}+\frac{1}{x^{3}}=?$

iii) $x^{4}+\frac{1}{x^{4}}=?$

iv) $x^{6}+\frac{1}{x^{6}}=?$

v) $x^{5}+\frac{1}{x^{5}}=?$

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10. If $x^{5}+\frac{1}{x^{5}}=123$, Then find $x^{2}+\frac{1}{x^{2}}=?$

A) 7 B) 0 C) 11 D) 9

11. If $x^{5}+\frac{1}{x^{5}}=2525$, Then find $x^{2}+\frac{1}{x^{2}}=?$

A) 27 B) 23 C) 21 D) 25

12. If $c+\frac{1}{c}=5$; then find $\frac{1}{(c-5)^7}+c^7=?$

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

13. If $x^{12.5}+\frac{1}{x^{12.5}}=15$, then $x^{25}+\frac{1}{x^{25}}=?$

A) 223 B) 227 C) 229 D) 221

14. If $\frac{x^{42}+1}{x^{21}}=8$, then $\frac{x^{84}+1}{x^{42}}=?$

A) 64 B) 66 C) 62 D) 60

15. If $\sqrt{x}+\frac{1}{\sqrt{x}}=3, x>0$, then find $x^2(x^2-47)=?$

A) 0 B) 2 C) –1 D) –2

16. If $p^4+\frac{1}{p^4}=119$; find $(2p-3)^2=?$

A) 15 B) 13 C) 12 D) 17

17. $5a+\frac{1}{3a}=5$, then find $9a^2+\frac{1}{25a^2}=?$

A) $\frac{51}{5}$ B) $\frac{29}{5}$ C) $\frac{52}{5}$ D) $\frac{39}{5}$

18. If $3x+\frac{2}{x}=7$, then $9x^2+\frac{4}{x^2}=?$

A) 25 B) 35 C) 49 D) 37

19. If $x-\frac{1}{x}=4$ Then find

i) $x^2+\frac{1}{x^2}=?$ 18

ii) $x^3+\frac{1}{x^3}=?$ 76

iii) $x^4+\frac{1}{x^4}=?$ 322

20. If $x^{2020}-\frac{1}{x^{2020}}=27$, then $x^{4040}+\frac{1}{x^{4040}}=?$

A) 735 B) 729 C) 733 D) 731

21. If $x^6-\frac{1}{x^6}=7$; Then find $x^{18}+\frac{1}{x^{18}}=?$

A) 366 B) 364 C) 362 D) 368

22. $8x-\frac{1}{2x}=6$, then find $16x^2+\frac{1}{16x^2}=?$

A) $\sqrt{7}$ B) $\sqrt{11}$ C) 7 D) 11

23. If $x^{15}+\frac{1}{x^{15}}=9$, then $x^{45}+\frac{1}{x^{45}}=?$

A) 729 B) 756 C) 702 D) 774

24. If $4x^2-6x+1=0$, then the value of $8x^3+(8x^3)^{-1}$ is

A) 36 B) 13 C) 18 D) 11

25. If $x+\frac{1}{16x}=3$, then the value of $16x^3+\frac{1}{256x^3}$ is

A) 423 B) 414 C) 432 D) 441

26. If $x^4+x^{-4}=2207,(X>0)$, then the value of $X+X^{-1}$ is

A) 19 B) 7 C) 11 D) 9

27. If $x^4+x^{-4}=2599$, then what is the value of $X-X^{-1}$ where x > 0?

A) 5 B) 8 C) 7 D) 6

28. If $x^4+x^{-4}=2207$, (x > 0) then the value of (x – 2) (x – 3) (x – 4) (x – 5) is?

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A) 77 B) 99 C) 19 D) 11

29. If $x^4+x^{-4}=194$, (x > 0), then the value of $(2x-4)^2$ is?

A) 15 B) 20 C) 12 D) 16

30. $x^4+x^{-4}=1154$, (x > 0), then the value of $2(x-3)^2=?$

A) 16 B) 12 C) 20 D) 15

31. If $x^8-1442x^4+1=0$, then a possible value of $x-\frac{1}{x}$ is?

A) 5 B) 8 C) 6 D) 4

32. If $x^2-4x+1=0$; Then find $x^9+x^7-194x^5-194x^3=?$

A) 9 B) -4 C) 1 D) 2

33. If $x^2-3x+1=0$; Then find $x^{12}+x^8-123x^7-123x^3=?$

A) -7 B) 4 C) 3 D) 7

34. If $x^2-\sqrt{6}x-1=0$, Then find $x^{10}-61x^6-62x^2=?$

A) 9 B) -8 C) 4 D) 3

35. If $x^2-\sqrt{7x}-1=0$; Then find $x^{10}-78x^6-79x^2=?$

A) -9 B) -4 C) 1 D) -2

36. If $x^{11}-\frac{1}{x^{11}}=2\sqrt{10}$, Then find $x^{11}+\frac{1}{x^{11}}=?$

A) $2\sqrt{10}$ B) $8\sqrt{5}$ C) $2\sqrt{11}$ D) 11

37. If $x-\frac{1}{x}=2$; Then find $x^2-\frac{1}{x^2}=?$

A) $4\sqrt{2}$ B) $4\sqrt{5}$ C) $4\sqrt{3}$ D) 8

38. If $x^6+\frac{1}{x^6}=2\sqrt{10}$; Then find $x^{18}-\frac{1}{x^{18}}=?$

A) 234 B) 123 C) 236 D) 232

39. If $3x+\frac{2}{x}=7$, then $9x^2-\frac{4}{x^2}=?$

A) 25 B) 35 C) 49 D) 37

40. If $x+\frac{1}{x}=4$ and $x^2+\frac{1}{x^3}=24$ Then find $x^3+\frac{1}{x^2}=?$

A) 49 B) 47 C) 41 D) 42

41. If $x^2-16x+59=0$, then find $(x-6)^2-\frac{1}{(x-6)^2}=?$

A) $9\sqrt{7}$ B) $8\sqrt{5}$ C) $8\sqrt{3}$ D) 18

42. If $x^2-22x+111=0$, then find $(x-8)^2-\frac{1}{(x-8)^2}=?$

A) $12\sqrt{10}$ B) $8\sqrt{5}$ C) $8\sqrt{3}$ D) 18

43. If $x^2-12x+33=0$, then find $(x-4)^4+\frac{1}{(x-4)^4}=?$

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

44. If $x^2+x(6-\sqrt{3})+10-3\sqrt{3}=0$, find $(x+3)^{17}+\frac{1}{(x+3)^{17}}=?$

A) $\sqrt{7}$ B) $\sqrt{5}$ C) $-\sqrt{3}$ D) 3

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

A) 110 B) 125 C) 140 D) 120

46. If $x^2-29x+199=0$, then $(x-11)^3-\frac{1}{(x-11)^3}=?$

A) $144\sqrt{5}$ B) $96\sqrt{5}$ C) $121\sqrt{5}$ D) $31\sqrt{5}$

47. If $\frac{6x}{(2x^2+5x-2)}=1$, $x>0$ then the value of $x^3+\frac{1}{x^3}=?$

A) $\frac{3\sqrt{17}}{4}$ B) $\frac{5\sqrt{17}}{8}$ C) $\frac{5\sqrt{17}}{16}$ D) $\frac{3\sqrt{17}}{4}$

48. If $\frac{8x}{2x^2+7x-2}=1$, $x>0$ then find $x^3+\frac{1}{x^3}=?$

A) $\frac{5\sqrt{17}}{8}$ B) $\frac{3\sqrt{17}}{4}$ C) $\frac{5\sqrt{17}}{16}$ D) $\frac{3\sqrt{17}}{4}$

49. If $x+\frac{1}{x+7}=0$, then $x-\frac{1}{x+7}=?$

A) $3\sqrt{5}-5$ B) $3\sqrt{5}-7$ C) $3\sqrt{7}-5$ D) $3\sqrt{7}-7$

50. $a=\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ and $b=\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ value of $a^2+b^2-ab?$

A) 97 B) $(2\sqrt{3})+2$ C) $(4\sqrt{6})+1$ D) 98

51. $a=\frac{2+\sqrt{3}}{2-\sqrt{3}}$ and $b=\frac{2-\sqrt{3}}{2+\sqrt{3}}$ value of $a^2+b^2+ab?$

A) 185 B) 195 C) 200 D) 175

52. $a=\frac{3+\sqrt{7}}{3-\sqrt{7}}$ and $b=\frac{3-\sqrt{7}}{3+\sqrt{7}}$ value of $(a-b)^2+ab?$

A) 257 B) 255 C) 253 D) 259

53. If $x=\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$ and $y=\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}}$, then $\frac{x^2+xy+y^2}{x^2-xy+y^2}=?$

A) $\frac{63}{61}$ B) $\frac{67}{65}$ C) $\frac{65}{63}$ D) $\frac{69}{67}$

54. If $x=\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$ and y is the reciprocal of x, then what is the value of $(x^3+y^3)?$

A) 504 B) 476 C) 472 D) 488

55. If $P=7+4\sqrt{3}$ and PQ = 1, then what is the value of $\left(\frac{1}{P^2}\right)+\left(\frac{1}{Q^2}\right)?$

A) 148 B) 189 C) 194 D) 204

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ALGEBRA-4

1. $25a^2-9$ is factored as?

A) (5a + 3)(5a – 3) B) (5a – 3)(5a – 4)
C) (25a + 1)(a – 9) D) (5a + 1)(5a – 9)

2. The factors of $(a^2+4b^2+4b-4ab-2a-8)$ are?

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

3. If $(x-4)^2+(y-3)^2+(z+5)^2=0$ then $\frac{x^2}{8}+\frac{y^2}{18}+\frac{z^2}{50}=?$

A) 4 B) $3\frac{1}{6}$ C) $4\frac{1}{5}$ D) 3

4. If $x^2+y^2+z^2=123$ and x + y + z = 17 then xy + yz + zx =?

A) 89 B) 84 C) 83 D) 81

5. If x + y + z = 27 and xy + yz + zx = 64 then $x^2+y^2+z^2$ =?

A) 609 B) 601 C) 613 D) 621

6. If $10x^2+y^2+6xy+2x+1=0$, then 3x + 4y =?

A) 9 B) 12 C) 10 D) 7

7. If $(a+b-6)^2+a^2+b^2+1+2b=2ab+2a$, then a =?

A) 7 B) 3.5 C) 6 D) 2.5

8. If $(a+b-c-3)^2+(b+c-a-8)^2+(c+a-b-5)^2=0$ then $\sqrt{(a+b+c)}=?$

A) $2\sqrt{2}$ B) 3 C) 4 D) $\sqrt{2}$

9. If a, b, c are non-zero real numbers and

$a^2+b^2+c^2+2ab-2bc-2ca=0$, then $\frac{4(a+b+c)+c}{a+b}=?$

A) 1 B) 5 C) 6 D) 9

10. If a, b, c are non zero real numbers and

$a^2+b^2+c^2=-2(ab+bc+ca)$, then $\frac{7(a+b+c)+3b}{4b}=?$

A) 0 B) –1 C) 1 D) $\frac{3}{4}$

11. If (2x + 3y + 4) (2x + 3y – 5) is equivalent to $(ax^2+by^2+2hxy+2gx+2fy+C)$, then what is the value of {(g + f – c)/abh}?

A) $\frac{37}{216}$ B) $\frac{19}{216}$ C) $\frac{19}{108}$ D) $\frac{35}{432}$

12. The coefficient of x^2 in $(2x+y)^3$ is

A) $12y^2$ B) 12y C) 8 D) 12

13. The coefficient of x in $(x-3y)^3$ is

A) $-3y^2$ B) $27y^2$ C) $-27y^2$ D) $3y^2$

14. The coefficient of y in the expansion of $(2y-5)^3$, is

A) 150 B) 50 C) –30 D) –150

15. If $a^2+b^2+c^2+96=8(a+b-2c)$, then $\sqrt{ab-bc+ca}$ is equal to

A) $2\sqrt{3}$ B) 4 C) 6 D) $2\sqrt{2}$

16. If $16x^2+9y^2+4z^2=24(x-y+z)-61$, then the value of (xy + 2z) is

A) 1 B) 2 C) 3 D) 5

17. If $a^2+b^2+64c^2+16c+3=2(a+b)$, then the value of $4a^7+b^7+8c^2$ is

A) $3\frac{7}{8}$ B) $4\frac{7}{8}$ C) $4\frac{1}{8}$ D) $5\frac{1}{8}$

18. If $9a^2+4b^2+c^2+21=4(3a+b-2c)$, then the value of (9a +

4b – c) is

A) 2 B) 16 C) 6 D) 12

19. If a = 52, b =54, c = 56, then find $a^2+b^2+c^2-ab-bc-ca=?$

A) 15 B) 12 C) 10 D) 17

20. If a = 71, b =75, c = 79, then find $a^2+b^2+c^2-ab-bc-ca=?$

A) 49 B) 48 C) 45 D) 42

21. If a = 83, b =83, c = 89, then find $a^2+b^2+c^2-ab-bc-ca=?$

A) 39 B) 25 C) 36 D) 15

22. If a = 95, b =91, c = 91, then find $a^2+b^2+c^2-ab-bc-ca=?$

A) 16 B) 12 C) 25 D) 17

23. If a = 600, b = 602 and c = 604, then the value of $a^3+b^3+c^3-3abc?$

A) 23715 B) 21672 C) 22784 D) 20247

24. If a = 299, b = 298, c = 297 then the value of $2a^3+2b^3+2c^3-6abc=?$

A) 5154 B) 5267 C) 5364 D) 5456

25. If x = 222, y = 222, z = 225, then find $x^3+y^3+z^3-3xyz=?$

A) 4950 B) 5994 C) 4683 D) 6021

26. $$\frac{(1.2)^3+(0.8)^3+(0.7)^3-2.016}{1.35[(1.2)^2+(0.8)^2+(0.7)^2-0.96-0.84-0.56]}=?$$

A) 1/4 B) 1/2 C) 1 D) 2

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

A) 0 B) 9 C) 27 D) 81

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

A) $\frac{xyz}{3abc}$ B) 3xyzabc C) $\frac{3xyz}{abc}$ D) $\frac{xyz}{abc}$

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

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

30. If $(2x+3)^3+(x-8)^3+(x+13)^3=(2x+3)(3x-24)(x+13)$, then what is the value of x?

A) –1.5 B) –2.5 C) –2 D) –1

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

A) $\frac{5}{6}$ B) $\frac{3}{4}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$

32. If $(5x-3)^3+(2x+5)^3+27(4-3x)^3=9(3-5x)(2x+5)(3x-4)$, then the value of (2x + 1) is

A) –13 B) 13 C) 15 D) –15

33. If $(4x-3)^3+(2x+5)^3+(5x-7)^3=(4x-3)(6x+15)(5x-7)$ and $x\neq\frac{5}{11}$ then x =?

A) 3 B) 4 c) $\frac{11}{5}$ D) -5

34. If $(2a-1)^3+(3a+2)^3+(4a+5)^3=3(2a-1)(3a+2)(4a+5)$ where $(a\neq\frac{2}{3})$ find a?

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A) 3 B) -4 c) $\frac{11}{5}$ D) -3

35. If x + y + z = 19, $x^2+y^2+z^2=133$ and $xz=y^2$ then the Difference between z and x is?

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

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

A) 948 B) 999 C) 942 D) 1009

37. If x + y + z = 11 $x^2+y^2+z^2=133$ and $x^3+y^3+z^3=881$, then the value of $\sqrt[3]{xyz}$ is

A) –8 B) 6 C) 8 D) –6

ALGEBRA-5

1. $\frac{a^3(b^2-c^2)+b^3(c^2-a^2)+c^3(a^2-b^2)}{a^2(b-c)+b^2(c-a)+c^2(a-b)}=?$

A) ab + bc + ca B) 1 C) 0 D) a + b + c

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

A) abc B) a + b + c C) ab + bc + ca D) 3

3. $\frac{a(b-c)^2}{(c-a)(a-b)}+\frac{b(c-a)^2}{(a-b)(b-c)}+\frac{c(a-b)^2}{(b-c)(c-a)}=?$

A) a + b + c B) 3 C) $a^2+b^2+c^2$ D) abc

4. If $\frac{x}{y}=\frac{z}{w}$ find $\frac{x^m+y^m+z^m+w^m}{x^{-m}+y^{-m}+z^{-m}+w^{-m}}$

A) 1 B) $\frac{x}{y}$ C) $(xyzw)^m$ D) $(xyzw)^{m/2}$

5. $(x+y+z)^3-(x+y-z)^3-(y+z-x)^3-(z+x-y)^3=?$

A) 8(x + y + z) B) 24xyz C) 12xyz D) 24

6. 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

7. If bc + ca + ab = abc, then $\frac{b+c}{bc(a-1)}+\frac{c+a}{ca(b-1)}+\frac{a+b}{ab(c-1)}=?$

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

8. If $\frac{m-a^2}{b^2+c^2}+\frac{m-b^2}{c^2+a^2}+\frac{m-c^2}{a^2+b^2}=3$, then find the value of m?

A) $a^2+b^2-c^2$ B) a^2+b^2

C) $a^2+b^2+c^2$ D) $a^2-b^2-c^2$

9. If abc = 1, then find $\frac{a+1}{ab+a+1}+\frac{b+1}{bc+b+1}+\frac{c+1}{ca+c+1}=?$

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

10. If a + b = 1; then $a^4+b^4-a^3-b^3-2a^2b^2+ab$ is equal to

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

11. $p^3+q^3+r^3-3pqr=4$; if a = q + r ; b = r + p and c = p + q, then what is the value of $a^3+b^3+c^3-3abc$?

A) 4 B) 8 C) 2 D) 12

12. 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) $\frac{3}{4}$

13. If $\sqrt{\left(1-p^2\right)\left(1-q^2\right)}=\frac{\sqrt{3}}{2}$, then what is the value of $\sqrt{2p^2+2q^2+2pq}+\sqrt{2p^2+2q^2-2pq}$?

A) 2 B) $\sqrt{2}$ C) 1 D) None of these

14. If $x^3+y^3+z^3=3(1+xyz)$, if 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

15. If $x^3+y^3+z^3=2(5+1.5xyz)$; if P= y + z – x , Q = z + x – y and R = x + y – z then find $P^3+Q^3+R^3-3PQR=?$

A) 40 B) 38 C) 42 D) 20

16. 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) $\frac{1}{a^2+b^2+c^2}$ B) 1 C) –1 D) 0

17. If x + y + z = 0 Find $\frac{3y^2+x^2+z^2}{2y^2-xz}=?$

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

18. If a + b + c = 6 and ab + bc + ca = 1, then bc(b + c) + ca(c + a) + ab(a + b) + 3abc = ?

A) 3 B) 6 C) 5 D) 0

19. 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

20. 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) 1/3 D) 0

21. If a + b + c = 0, then $\frac{a^2+b^2+c^2}{a^2-bc}=?$

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

22. If $x_1x_2x_3=4(4+x_1+x_2+x_3)$, then what is the value of $[1/(2+x_1)]+[1/(2+x_2)]+[1/(2+x_3)]$?

A) 1 B) 1/2 C) 2 D) 1/3

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

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A) –1 B) 1 C) 2 D) 0

24. 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

25. If $x=\frac{ab}{a+b}$; find $\frac{x^2}{(x-a)(x-b)}=?$

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

26. If $x=p+\frac{1}{p}; y=p-\frac{1}{p};$ find $\frac{(x^2-y^2)^2(y^2+2)}{(x^2-2)}=?$

A)16 B) 12 C) 14 D) 0

27. 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) $a^2+b^2+c^2$ B) 0 C) 1 D) 2

28. If $a^2+b^2+c^2=16, x^2+y^2+z^2=25$ and ax + by + cz = 20, then $\frac{a+b+c}{x+y+z}=?$

A) $\frac{3}{5}$ B) $\frac{5}{3}$ C) $\frac{4}{5}$ D) $\frac{5}{4}$

29. Solve the following:
(a + b + c) (ab + bc + ca) – abc = ?
A) (a + b)(b + c) (c – a) B) (a + b)(b – c) (c + a)
C) (a + b)(b + c) (c + a) D) (a – b)(b – c) (c – a)

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30. ab (a – b) + bc (b – c) + ca (c – a) is equal to
A) (a + b) (b – c) (c – a) B) (a – b) (b – c) (c – a)
C) (b – a) (b – c) (c – a) D) (a – b) (b + c) (c – a)

31. If pq + qr + rp = 0, then $\left(\frac{p^2}{p^2-qr}+\frac{q^2}{q^2-rp}+\frac{r^2}{r^2-pq}\right)=?$

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