ALGEBERA

SHEET - 02

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Rankers Gurukul

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MATHS EXPERT

ALGEBRA (बीजगणित)

(Practice Sheet – 2)

Concept of Perfect Square

1. If $(a-3)^2+(b-4)^2+(c-9)^2=0$, then $\sqrt{a+b+c}$ = ?
   (a) –4 (b) 4
   (c) ±4 (d) ±2
2. If $(a-1)^2+(b+2)^2+(c+1)^2=0$, then find $2a-3b+7c$ = ?
   (a) 12 (b) –11
   (c) 3 (d) 1
3. If $(a-4)^2+(b-5)^2+(c-3)^2=0$, then the value of $\frac{a+b}{c}$ is
   (a) 0 (b) 3
   (c) 1 (d) –3
4. If $(x+y-z)^2+(y+z-x)^2+(z+x-y)^2=0$, then $x+y+z$ = ?
   (a) $\sqrt{3}$ (b) $3\sqrt{3}$
   (c) 3 (d) 0
5. If $a^2+b^2+c^2=2(a-b-c)-3$, then the value of $4a-3b+5c$ is –
   (a) 2 (b) 3
   (c) 5 (d) 6
6. If $a^2+b^2+4c^2=2(a+b-2c)-3$ and a, b, c are real numbers, then the value of $(a^2+b^2+c^2)$ is :
   (a) 3
   (b) $3\frac{1}{4}$
   (c) 2
   (d) $2\frac{1}{4}$
7. If $x^2+y^2+z^2=2(x+z-1)$, then the value of $x^3+y^3+z^3$ is
   (a) 2
   (b) 0
   (c) –1
   (d) 1
8. If $a^2+b^2+c^2=2(a-2b-2c)-9$. find the value of $a^3+b^4-c^2$.
   (a) 3 (b) 0
   (c) 13 (d) –13
9. If $16x^2+9y^2+4z^2=24(x-y+z)-61$, then the value of $(xy+2z)$ is :
   CGL CGL 4 June 2019 (Afternoon)
   (a) 1
   (b) 2
   (c) 3
   (d) 5
10. If $a^2+b^2+64c^2+16c+3=2(a+b)$, then the value of $4a^7+b^7+8c^2$ is :
    CGL CGL 4 June 2019 (Evening)
    (a) $3\frac{7}{8}$ (b) $4\frac{7}{8}$
    (c) $4\frac{1}{8}$ (d) $5\frac{1}{8}$
11. If $2x^2+y^2+6x-2xy+9=0$, then the value of $4x^3-y^3+x^2y^2$ is :
    CGL CGL 6 June 2019 (Afternoon)
    (a) 0 (b) 9
    (c) – 3 (d) – 9
12. If $a^2+b^2+c^2+27=6(a+b+c)$, then the value of $\sqrt[3]{a^3+b^3-c^3}$ is :
    CGL CGL 10 June 2019 (Morning)
    (a) 3 (b) 1
    (c) 9 (d) 6
13. If $a^2+b^2+c^2+216=12(a+b-2c)$, then find the value of $\sqrt{ab-bc-ca}$.
    CPO 2019 23/11/2020 (Morning)
    (a) 6 (b) 4
    (c) 3 (d) 8
14. If $2x^2+y^2+8z^2-2\sqrt{2}xy+4\sqrt{2}yz-8xz=(Ax-y+Bz)^2$, then the value of (A^2+B^2-AB) is
    CGL CGL 4 March 2020 (Evening)
    (a) 16 (b) 14
    (c) 6 (d) 18

QUESTIONS BASED ON $(a^3+b^3+c^3-3abc)$

15. If $a = 96$, $b = 97$, $c = 98$, find $a^2 + b^2 + c^2 - ab - bc - ca$ = ?
(a) 2 (b) 3
(c) 15 (d) 6

16. If $x = 2015$, $y = 2014$ and $z = 2013$ then the value of $x^2 + y^2 + z^2 - xy - yz - zx$
(a) 3 (b) 4
(c) 5 (d) 6

17. If $x = 997$, $y = 998$, $z = 999$, then the value of $x^2 + y^2 + z^2 - xy - yz - zx$ will be :
(a) 3 (b) 9
(c) 16 (d) 4

18. If $a = 355$, $b = 356$, $c = 357$
Find $a^3 + b^3 + c^3 - 3abc$ = ?
(a) 3208
(b) 3202
(c) 3206
(d) 3204

SSC CHSL 15/10/2020(Morning)

19. If $a = 94$, $b = 95$, $c = 96$, then $a^3 + b^3 + c^3 - 3abc$ = ?
(a) 890
(b) 302
(c) 855
(d) 845

20. If $a = 25$, $b = 15$ and $c = 10$, then find
$$\frac{a^3+b^3+c^3-3abc}{(a-b)^2+(b-c)^2+(c-a)^2}$$
(a) 30
(b) – 25
(c) – 30
(d) 25

21. If $a^3 + b^3 + c^3 - 3abc = 0$ and $a + b + c \neq 0$ then
(a) $a > b > c$
(b) $a = b = c$
(c) $a > b < c$
(d) $a < b < c$

22. If $x + y + z = 0$, then $x^3 + y^3 + z^3 - 3xyz$ = ?
(a) 0
(b) $3xyz$
(c) $-3xyz$
(d) z^3

23. If $a^3 - b^3 - c^3 - 3abc = 0$, then
(a) $a = b = c$
(b) $a + b + c = 0$
(c) $a + c = b$
(d) $a = b + c$

24. If $a^3 - b^3 - c^3 = 0$,
Then $a^9 - b^9 - c^9 - 3a^3b^3c^3$ = ?
(a) 1 (b) 3
(c) 0 (d) – 1

25. The value of $(x - z)^3 + (y - x)^3 + (z - y)^3$ is :
(a) $3(y - z)(z + x)(y - x)$
(b) $(x - y)(y + z)(x - z)$
(c) $3(x - z)(y - x)(z - y)$
(d) $(y - z)(z - x)(x - y)$

26. Find
$$\frac{(a-b)^2}{(b-c)(c-a)}+\frac{(b-c)^2}{(a-b)(c-a)}+\frac{(c-a)^2}{(b-c)(a-b)} = ?$$
(a) 0 (b) 3
(c) $\frac{1}{3}$ (d) 2

27. If $x = a(b - c)$, $y = b(c - a)$ and $z = c(a - b)$, then the value of $\left(\frac{x}{a}\right)^3+\left(\frac{y}{b}\right)^3+\left(\frac{z}{c}\right)^3$ is :
(a) $\frac{xyz}{3abc}$ (b) $3xyzabc$
(c) $\frac{3xyz}{abc}$ (d) $\frac{xyz}{abc}$

28. If $a = 2.361$, $b = 3.263$ and $c = -5.624$, then find the value of $a^3 + b^3 + c^3 - 3abc$.
(a) 35.621
(b) 0
(c) 19.277
(d) 1

29. Find $\frac{(x^2-y^2)^3+(y^2-z^2)^3+(z^2-x^2)^3}{(x-y)^3+(y-z)^3+(z-x)^3}$ = ?
(a) $(x^2 - y^2)(y^2 - z^2)(z^2 - x^2)$
(b) $3(x - y)(y - z)(z - x)$
(c) $(x + y)(y + z)(z + x)$
(d) $3(x + y)(y + z)(z + x)$

30. If $a + b + c = 8$, then the value of $(a-4)^3 + (b-3)^3 + (c-1)^3$ is :
(a) $2(a-4)(b-3)(c-1)$
(b) $4(a-4)(b-3)(c-1)$
(c) $1(a-4)(b-3)(c-1)$
(d) $0(a-4)(b-3)(c-1)$

31. If $x + y + z = 6$, then $(x-1)^3 + (y-2)^3 + (z-3)^3 = ?$
(a) $3(x-1)(y+2)(z-3)$
(b) $3(x+1)(y-2)(z-3)$
(c) $3(x-1)(y+2)(z-3)$
(d) $3(x-1)(y-2)(z-3)$

32. If $a + b + c = 6$, then find $\frac{(a-1)^3 + (b-2)^3 + (c-3)^3}{(a-1)(b-2)(c-3)} = ?$
(a) 8 (b) 5
(c) 20 (d) 3

33. If $(3x+1)^3 + (x-3)^3 + (4-2x)^3 + 6(3x+1)(x-3)(x-2) = 0$, then what is the value of x?
SSC CHSL 11 July 2019 (Morning)
(a) -1 (b) $-\frac{1}{2}$
(c) 1 (d) $\frac{1}{2}$

34. If $(5x+1)^3 + (x-3)^3 + 8(3x-4)^3 = 6(5x+1)(x-3)(3x-4)$, then x is equal to :
CGL Tier II (12 September 2019)
(a) $\frac{5}{6}$ (b) $\frac{1}{3}$
(c) $\frac{2}{3}$ (d) $\frac{3}{4}$

35. If $x^{\frac{1}{3}} + y^{\frac{1}{3}} = z^{\frac{1}{3}}$, then find $(x + y - z)^3 + 27xyz = ?$
(a) 0 (b) 1
(c) -1 (d) 27

36. If $a^{\frac{1}{3}} + b^{\frac{1}{3}} + c^{\frac{1}{3}} = 0$, then $(a + b + c)^6$ is equal to :
SSC CHSL 10 July 2019 (Afternoon)
(a) $81\,abc$ (b) $729a^2b^2c^2$
(c) $729\,abc$ (d) $81\,a^2b^2c^2$

37. Solve it :
$$\frac{(a^2-b^2)^3 + (b^2-c^2)^3 + (c^2-a^2)^3 + 3(a^2-b^2)(b^2-c^2)(c^2-a^2)}{(a-b)(b-c)(c-a)}$$
(a) $6(a+b)(b+c)(c+a)$
(b) $2(a+b)(b+c)(c+a)$
(c) $5(a+b)(b+c)(c+a)$
(d) $3(a+b)(b+c)(c+a)$

38. If $x + y + z = 19$, $xy + yz + zx = 114$, then the value of $\sqrt{x^3 + y^3 + z^3 - 3xyz}$ is :
SSC CGL 4 June 2019 (Afternoon)
(a) 21 (b) 17
(c) 19 (d) 13

39. If $a + b + c = 4$ and $ab + bc + ca = 2$, then $a^3 + b^3 + c^3 - 3abc$ is equal to :
SSC CGL 11 June 2019 (Evening)
(a) 36 (b) 32
(c) 48 (d) 40

40. If $x + y + z = 19$, $xyz = 216$ & $xy + yz + zx = 114$ then the value of $\sqrt{x^3 + y^3 + z^3 + xyz}$ is :
SSC CHSL 1 July 2019 (Evening)
(a) 32 (b) 30
(c) 28 (d) 35

41. If $x + y + z = 19$, $x^2 + y^2 + z^2 = 133$ and $xz = y^2$, then the difference between z and x is :
SSC CGL 4 June 2019 (Morning)
(a) 5 (b) 3
(c) 6 (d) 4

42. If $a + b + c = 5$ and $a^2 + b^2 + c^2 = 27$ and $a^3 + b^3 + c^3 = 125$, then the value of $4abc$ is :
SSC CHSL 2 July 2019 (Morning)
(a) -20 (b) -15
(c) 15 (d) 20

43. If $ab + bc + ca = 8$ and $a^2 + b^2 + c^2 = 20$, then possible value of $\frac{1}{2}(a + b + c)[(a-b)^2 + (b-c)^2 + (c-a)^2]$ is :
SSC CGL 6 June 2019 (Morning)
(a) 72 (b) 56
(c) 84 (d) 80

44. If $a + b + c = 15$ and $a^2 + b^2 + c^2 = 83$ then value of $a^3 + b^3 + c^3 - 3abc$
(a) 200 (b) 190
(c) 180 (d) 210

QUESTIONS BASED ON $(a^3 + b^3)$ and $(a^3 - b^3)$

45. If $a^3 - b^3 = 216$ and $a - b = 6$, then $(a + b)^2 - ab$ is equal to :
SSC CPO 15 March 2019 (Evening)
(a) 38
(b) 42
(c) 52
(d) 36

46. If $(a - b) = 4$ and $ab = 2$, then $(a^3 - b^3)$ is equal to :
SSC CGL 13 June 2019 (Morning)
(a) 92
(b) 88
(c) 84
(d) 80

47. If $(a - b) = 5$ and $ab = 6$, then $(a^3 - b^3)$ is equal to :
SSC CGL 13 June 2019 (Afternoon)
(a) 225
(b) 155
(c) 90
(d) 215

48. If $(a + b) = 6$ and $ab = 8$, then $(a^3 + b^3)$ is equal to :
SSC CGL 12 June 2019 (Morning)
(a) 216
(b) 108
(c) 144
(d) 72

49. If $a^3 + b^3 = 432$ and $a + b = 12$, then $(a + b)^2 - 3ab$ is equal to :
SSC CPO 16 March 2019 (Afternoon)
(a) 42
(b) 52
(c) 36
(d) 38

50. If $(8x^3 - 27y^3) \div (2x - 3y) = (Ax^2 + Bxy + Cy^2)$, then the value of $(2A + B - C)$ is :
SSC CGL 6 June 2019 (Morning)
(a) 4
(b) 6
(c) 5
(d) 3

51. If $\left(5\sqrt{5}x^3 - 81\sqrt{3}y^3\right) \div \left(\sqrt{5}x - 3\sqrt{3}y\right) = Ax^2 + By^2 + Cxy$, then the value of $(6A + B - \sqrt{15C})$ is :
SSC CGL 4 June 2019 (Morning)
(a) 10 (b) 9
(c) 15 (d) 12

52. If $3\sqrt{3}x^3 - 2\sqrt{2}y^3 = \left(\sqrt{3}x - \sqrt{2}y\right)(Ax^2 - Bxy + Cy^2)$, then the value of $(A^2 - B^2 + C^2)$ is :
SSC CHSL 2 July 2019 (Morning)
(a) 10 (b) 17
(c) 7 (d) 1

53. If $2\sqrt{2}x^3 - 3\sqrt{3}y^3 = \left(\sqrt{2}x - \sqrt{3}y\right)(Ax^2 + By^2 + Cxy)$, then the value of $A^2 + B^2 - C^2$ is :
CGL Tier II (11 September 2019)
(a) 11 (b) 7
(c) 19 (d) 10

54. If $(8x^3 + 27y^3) \div (2x + 3y) = (Ax^2 + Bxy + Cy^2)$, then the value of $(5A + 4B + 3C)$ is :
SSC CGL 7 June 2019 (Evening)
(a) 26 (b) 23
(c) 24 (d) 27

55. If $5\sqrt{5}x^3 + 2\sqrt{2}y^3 = \left(Ax + \sqrt{2}y\right)(Bx^2 + 2y^2 + Cxy)$, then the value of $(A^2 + B^2 - C^2)$ is
CGL Tier II (13 September 2019)
(a) 15 (b) 20
(c) 30 (d) 40

56. If $27(x + y)^3 - 8(x - y)^3 = (x + 5y)(Ax^2 + By^2 + Cxy)$, then what is the value of $(A + B - C)$?
CGL 2019 Tier II (15/11/2020)
(a) 13 (b) 16
(c) 18 (d) 11

57. If $8(x + y)^3 - (x - y)^3 = (x + 3y)(Ax^2 + Cy^2 + Bxy)$, then the value of $(A - B - C)$ is :
SSC CHSL 3 July 2019 (Evening)
(a) – 2 (b) – 6
(c) 10 (d) 14

Answer Key

1.(b)	**2.**(d)	**3.**(b)	**4.**(d)	**5.**(a)	**6.**(d)	**7.**(a)	**8.**(c)	**9.**(d)	**10.**(d)
11.(a)	**12.**(a)	**13.**(a)	**14.**(b)	**15.**(b)	**16.**(a)	**17.**(a)	**18.**(d)	**19.**(c)	**20.**(d)
21.(b)	**22.**(a)	**23.**(d)	**24.**(c)	**25.**(c)	**26.**(b)	**27.**(c)	**28.**(b)	**29.**(c)	**30.**(d)
31.(d)	**32.**(d)	**33.**(b)	**34.**(a)	**35.**(a)	**36.**(b)	**37.**(a)	**38.**(c)	**39.**(d)	**40.**(d)
41.(a)	**42.**(a)	**43.**(a)	**44.**(c)	**45.**(d)	**46.**(b)	**47.**(d)	**48.**(d)	**49.**(c)	**50.**(c)
51.(d)	**52.**(c)	**53.**(b)	**54.**(b)	**55.**(b)	**56.**(b)	**57.**(a)			