

ALGEBRA (SHEET-02)

बीजगणित

UPDATED

CLASS ROOM SHEET

FOR ALL EXAMS

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 Rankers Gurukul

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ALGEBRA / बीजगणित

(CLASSROOM SHEET-02)

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 $a^2 + b^2 + 49c^2 + 18 = 2(b - 28c - a)$ then
the value of $(a+b - 7c)$ is:

SSC CGL 12/04/2022 (Shift- 2)

(a) 4 (b) 3
(c) 2 (d) 1

7. If $a^2 + b^2 + 49c^2 + 18 = 2(b - 28c - a)$, then
the value of $(a - b - 7c)$ is:

SSC CGL 18/04/2022 (Shift- 2)

(a) 2 (b) 1
(c) 3 (d) 4

8. If $a^2 + b^2 + 49c^2 + 18 = 2(b + 28c - a)$, then
the value of $(2a - b + 7c)$ is:

SSC CGL 19/04/2022 (Shift- 2)

(a) -3 (b) 1
(c) -4 (d) 5

9. If $a^2 + b^2 + c^2 + 84 = 4(a - 2b + 4c)$, then
 $\sqrt{ab - bc + ca}$ is equal to:

SSC CPO 24/11/2020 (Shift-2)

(a) $4\sqrt{10}$ (b) $\sqrt{10}$
(c) $5\sqrt{10}$ (d) $2\sqrt{10}$

QUESTIONS BASED ON $(a + b + c)^2$

10. If $(a + b + c) = 16$, and $(a^2 + b^2 + c^2) = 90$, find the value of $(ab + bc + ca)$.

SSC CGL 14/07/2023 (Shift-01)

(a) 84 (b) 83
(c) 82 (d) 81

11. If $a + b - c = 5$ and $ab - bc - ac = 10$, then
find the value of $a^2 + b^2 + c^2$.

SSC CGL 18/04/2022 (Shift- 01)

(a) 15 (b) 45
(c) 5 (d) 40

12. If $a^2 + b^2 + c^2 = 6.25$ and $(ab+bc+ca) = 0.52$,
what is the value of $(a+b+c)$, if $(a+b+c) < 0$?

SSC CGL 11/04/2022 (Shift- 03)

(a) ± 2.7 (b) - 2.7
(c) - 2.8 (d) ± 2.8

13. If $x + y + z = 13$, $x^2 + y^2 + z^2 = 91$ and
 $xz = y^2$, then the difference between z and x is:

SSC CHSL 05/08/2021 (Shift- 01)

(a) 3 (b) 8
(c) 5 (d) 9

14. If $a + b + c = 3$, $a^2 + b^2 + c^2 = 6$ and $\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 1$,
Here, a, b & c are non-negative, then $abc = ?$

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$
(c) $\frac{1}{2}$ (d) $\frac{1}{3}$

QUESTIONS BASED ON

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

15. If $a + b + c = 6$, $a^2 + b^2 + c^2 = 14$ and $ab + bc + ca = 11$, then what is the value of $a^3 + b^3 + c^3 - 3abc$?

SSC CGL 02/12/2022 (Shift-03)

- (a) 31 (b) 12
(c) 18 (d) 42

16. If $a + b + c = 5$, $a^3 + b^3 + c^3 = 85$ and $abc = 25$, then find the value of $a^2 + b^2 + c^2 - ab - bc - ca$.

- (a) 2 (b) 4
(c) 6 (d) 8

17. Factorize the given algebraic expression.
 $x^3 + 27y^3 + 64z^3 - 36xyz$

- (a) $(x + 3y + 4z)(x^2 + 9y^2 + 16z^2 + 3xy + 12yz + 4xz)$
(b) $(x + 3y + 4z)(x^2 + 9y^2 + 16z^2 - 12xy^2 - 3yz - 4xz)$
(c) $(x - 3y - 4z)(x^2 + 9y^2 + 16z^2 - 3xy - 12yz - 4xz)$
(d) $(x + 3y + 4z)(x^2 + 9y^2 + 16z^2 - 3xy - 12yz - 4xz)$

18. What is the value of

$$\left[\frac{(2.247)^3 + (1.730)^3 + (1.023)^3}{-3 \times 2.247 \times 1.730 \times 1.023} \right]$$

$$\left[\frac{(2.247)^2 + (1.730)^2 + (1.023)^2 - 2.247 \times 1.730}{-1.730 \times 1.023 - 2.247 \times 1.023} \right]$$

- (a) 1.730 (b) 4
(c) 5 (d) 5.247

19. If $a + b + c = 5$ and $ab + bc + ca = 7$, then the value of $a^3 + b^3 + c^3 - 3abc$ is:

SSC CPO 05/10/2023 (Shift-01)

- (a) 20 (b) 25
(c) 15 (d) 30

20. If $(a + b + c) = 14$, and $(a^3 + b^3 + c^3 - 3abc) = 98$, find the value of $(ab + bc + ca)$.

SSC CGL 26/07/2023 (Shift-04)

- (a) 60 (b) 64
(c) 65 (d) 63

21. If $(a + b + c) = 12$, and $(a^2 + b^2 + c^2) = 50$, find the value of $(a^3 + b^3 + c^3 - 3abc)$.

SSC CGL 19/07/2023 (Shift-02)

- (a) 36 (b) 24
(c) 42 (d) 48

22. If $x + y + z = 2$, $x^3 + y^3 + z^3 - 3xyz = 74$, then $(x^2 + y^2 + z^2)$ is equal to :

SSC CGL 23/08/2021 (Shift- 03)

- (a) 22 (b) 29
(c) 26 (d) 24

23. If $x + y + z = 13$, $x^2 + y^2 + z^2 = 133$ and $x^3 + y^3 + z^3 = 847$, then the value of $\sqrt[3]{xyz}$ is:

SSC CPO 24/11/2020 (Shift- 02)

- (a) 8 (b) 7
(c) -9 (d) -6

24. If $a = 355$, $b = 356$, $c = 357$ find $a^3 + b^3 + c^3 - 3abc = ?$

SSC CHSL 15/10/2020 (Shift- 01)

- (a) 3208 (b) 3202
(c) 3206 (d) 3204

25. If $x = 222$, $y = 223$ and $z = 224$, then find the value of $x^3 + y^3 + z^3 - 3xyz$.

SSC CGL 12/12/2022 (Shift-04)

- (a) 2007 (b) 2004
(c) 2006 (d) 2005

26. Find $a^3 + b^3 + c^3 - 3abc$ if $a = 1001$, $b = 1004$ and $c = 1007$.

- (a) 80235 (b) 81234
(c) 79356 (d) 81324

27. If $x = z = 225$, and $y = 226$ then $x^3 + y^3 + z^3 - 3xyz = ?$

- (a) 765 (b) 676
(c) 576 (d) 674

28. If $a = 2022$, $b = 2021$ and $c = 2020$, then value of $a^2 + b^2 + c^2 - ab - bc - ca$ is:

SSC CHSL 26/05/2022 (Shift- 03)

- (a) 2 (b) 4
(c) 3 (d) 1

29. 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

30. If $a = 101$, $b = 102$ and $c = 103$, then $a^2 + b^2 + c^2 - ab - bc - ca$

SSC CGL 24/07/2023 (Shift-01)

- (a) 2 (b) 4
(c) 3 (d) 6

31. If $x = 32$, $y = 33$ and $z = 35$, then evaluate the expression $x^3 + y^3 + z^3 - 3xyz$.

SSC CHSL 01/06/2022 (Shift- 03)

- (a) 1120 (b) 1000
(c) 900 (d) 700

32. 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 06/06/2019 (Shift- 01)

- (a) 72 (b) 56
(c) 84 (d) 80

33. If $(a + b + c) = 19$, and $(a^2 + b^2 + c^2) = 155$, find the value of $(a - b)^2 + (b - c)^2 + (c - a)^2$.

SSC CGL 18/07/2023 (Shift-02)

- (a) 104 (b) 108
(c) 100 (d) 98

34. If $(a^3 + b^3 + c^3 - 3abc) = 405$, and $(a + b + c) = 15$, find the value of $(a - b)^2 + (b - c)^2 + (c - a)^2$.

SSC CGL 20/07/2023 (Shift-01)

- (a) 27 (b) 54
(c) 18 (d) 45

35. If $(a^3 + b^3 + c^3 - 3abc) = 405$, and $(a - b)^2 + (b - c)^2 + (c - a)^2 = 54$, find the value of $(a + b + c)$.

SSC CGL 26/07/2023 (Shift-02)

- (a) 15 (b) 45
(c) 9 (d) 27

36. Simplify the following expression.

$$\frac{(59 \times 59 \times 59) + (54 \times 54 \times 54) + (57 \times 57 \times 57) - 3(59)(54)(57)}{(59 + 54 + 57)}$$

SSC CHSL 27/05/2022 (Shift- 01)

- (a) 38 (b) 76
(c) 170 (d) 19

37. If $a = 25$, $b = 15$, $c = -10$, then

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

(a) 30 (b) -15
(c) -30 (d) 15

38. If $a^3 - b^3 - c^3 - 3abc = 0$, then

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

39. What is the value of $a^3 + b^3 + c^3$ if $(a + b + c) = 0$?

SSC CGL 14/07/2023 (Shift-02)

- (a) $a^2 + b^2 + c^2 - 3abc$
(b) 0
(c) $3abc$
(d) $a^2 + b^2 + c^2 - ab - bc - ca$

40. Find the value of $(1.6)^3 - (0.9)^3 - (0.7)^3$.

- (a) 3.24 (b) -3.24
(c) 3.024 (d) -3.024

41. 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 11/07/2019 (Shift- 01)

- (a) -1 (b) $-\frac{1}{2}$
(c) 1 (d) $\frac{1}{2}$

42. If $(4x - 5)^3 + (x - 2)^3 + 27(2x - 5)^3 = 9(4x - 5)(x - 2)(2x - 5)$, then the value of $\left(x + \frac{3}{2}\right)$ will be:

SSC CHSL 05/08/2021 (Shift- 02)

- (a) $\frac{1}{2}$ (b) $\frac{5}{2}$
(c) $\frac{3}{2}$ (d) $\frac{7}{2}$

43. 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 12/09/2019

- (a) $\frac{5}{6}$ (b) $\frac{1}{3}$
(c) $\frac{2}{3}$ (d) $\frac{3}{4}$

44. Given that $(5x - 3)^3 + (2x + 5)^3 + 27(4 - 3x)^3 = 9(3 - 5x)(2x + 5)(3x - 4)$, then the value of $(2x + 1)$ is :

SSC CGL Tier II 13/09/2019

- (a) -13 (b) 15
(c) -15 (d) 13

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 /03/2019 (Shift- 03)

- (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 13/06/2019 (Shift- 01)

- (a) 92 (b) 88
(c) 84 (d) 80

47. If $(a - b) = 9$, and $(a^3 - b^3) = 4410$, find the value of ab .

SSC CHSL 02/08/2023 Shift-02

- (a) 190 (b) 112
(c) 162 (d) 136

48. If $a + b = 10$ and $ab = 6$, then the value of $a^3 + b^3$ is:

SSC CPO 03/10/2023 (Shift-01)

- (a) 860 (b) 820
(c) 800 (d) 840

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

SSC CPO 16 /03/2019 (Shift- 02)

- (a) 42 (b) 52
(c) 36 (d) 38

50. If $\frac{x}{y} + \frac{y}{x} = 1$ and $x + y = 2$, then the value of $x^3 + y^3$ is:

SSC CPO 03/10/2023 (Shift-01)

- (a) 0 (b) 1
(c) 3 (d) 2

51. If $(8x^3 - 27y^3) \div (2x - 3y) = (Ax^2 + Bxy + Cy^2)$, then the value of $(2A + B - C)$ is :

SSC CGL 6 /06/2019 (Shift- 1)

- (a) 4 (b) 6
(c) 5 (d) 3

52. If $2\sqrt{2}x^3 - 3\sqrt{3}y^3 = (\sqrt{2}x - \sqrt{3}y)(Ax^2 + By^2 + Cxy)$, then the value of $A^2 + B^2 - C^2$ is :

CGL Tier II (11/09/2019)

- (a) 11 (b) 7
(c) 19 (d) 10

53. If $(8x^3 + 27y^3) \div (2x + 3y) = (Ax^2 + Bxy + Cy^2)$, then the value of $(5A + 4B + 3C)$ is :

SSC CGL 7/06/2019 (Shift- 03)

- (a) 26 (b) 23
(c) 24 (d) 27

54. If $5\sqrt{5}x^3 + 2\sqrt{2}y^3 = (Ax + \sqrt{2}y)(Bx^2 + 2y^2 + Cxy)$, then the value of $(A^2 + B^2 - C^2)$ is

CGL Tier II (13/09/2019)

- (a) 15 (b) 20
(c) 30 (d) 40

55. 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

56. 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 30/6/019 (Shift- 03)

- (a) - 2 (b) - 6
(c) 10 (d) 14

ANSWER KEY

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