**Algebra**

**Important Formulae**

1. (a+b)2 = a2 + 2ab + b2
2. (a-b)2 = a2 - 2ab + b2
3. (a+b)2 = (a-b)2 + 4ab
4. (a-b)2  = (a+b)2 - 4ab
5. (a+b)3 = a3+b3+3ab(a+b) = a3+b3+3a2b+3ab2
6. (a-b)3 = a3- b3-3ab(a-b) = a3- b3 - 3a2b + 3ab2
7. a3+b3 =(a+b)3 - 3ab(a+b)
8. a3- b3 =(a-b)3 + 3ab(a-b)
9. a2 -b2 = (a-b)(a+b)
10. a3 +b3 = (a+b)(a2-ab+b2)
11. a3 - b3 = (a-b)(a2+ab+b2)
12. am x an = am+n
13. am / an = am – n
14. (a/b)(m / n) =(b/a)-(m / n)
15. am / b – n = am x bn
16. C:\Users\tsuser.PC\Desktop\final.pngIf x + y + z = 6 and x² + y² + z² = 20, then find the value of x³ + y³ + z³ - 3xyz   
    a) 64 b) 70 c) 72 d) 76
17. C:\Users\tsuser.PC\Desktop\final.pngIf a2 + b2 + c2=2(a – b - c) - 3, then the value of 2a - 3b + 4c is\_   
    a) 3 b) 1 c) 2 d) 4
18. C:\Users\tsuser.PC\Desktop\final.pngIf a2 + b2 + 4c2 = 2(a + b - 2c) – 3 and a, b, c are real, then the value of (a2 + b2 + c2) is   
    a) 3 b) 3 1/4 c) 2 d) 2 1/4
19. C:\Users\tsuser.PC\Desktop\final.pngIf x2 = y + z, y2 = z + x and z2 = x + y, then the value of is   
    a) -1 b) 1 c) 2 d) 0
20. C:\Users\tsuser.PC\Desktop\final.pngIf, then the value of is –   
    a) 1 b) 3 c) 4 d) 0
21. C:\Users\tsuser.PC\Desktop\final.pngIf , then the value of is –   
    a) 9 b) 3 c) 4 d) 6
22. C:\Users\tsuser.PC\Desktop\final.pngIf x2 – 3x + 1 = 0, then the value of x2 + x + 1/x + 1/x² is   
    a) 10 b) 2 c) 6 d) 8
23. C:\Users\tsuser.PC\Desktop\final.pngIf 5a + = 5 , then the value of 9a2 + is \_   
    a) 34/5 b) 39/5 c) 42/2 d) 52/2
24. C:\Users\tsuser.PC\Desktop\final.pngIf x + = 7 , find x4 +   
    a) 2207 b) 2209 c) 2723 d) 2203
25. C:\Users\tsuser.PC\Desktop\final.pngIf x + = 2, find x8 +   
    a) 1 b) 0 c) 2 d) 3
26. C:\Users\tsuser.PC\Desktop\final.pngIf 2x - = 6, then the value of x2 + is\_   
    a) 19/2 b) 17/2 c) 18/3 d) 15/2
27. C:\Users\tsuser.PC\Desktop\final.pngIf a2 + = 98 (a > 0), then the value of a3 + will be \_   
    a) 535 b) 1030 c) 790 d) 970
28. C:\Users\tsuser.PC\Desktop\final.pngIf x + = 5 , then value of is \_   
    a) 70 b) 50 c) 110 d) 55
29. C:\Users\tsuser.PC\Desktop\final.pngIf x =2 + , y = 2 - , then the value of is\_   
    a) 7/38 b) 7 /40 c) 7/19 d) 7/26
30. C:\Users\tsuser.PC\Desktop\final.pngIf x = 1 + + then the value of (2x4 – 8x3 – 5x2 + 26x – 28) is\_   
    a) 6 b) 0 c) 3 d) 2
31. C:\Users\tsuser.PC\Desktop\final.pngWhat number must be added to the expression 16a2 – 12a to make it a perfect square?   
    a) b) c) d) 16
32. C:\Users\tsuser.PC\Desktop\final.pngIf (nr –tn + ) be a perfect square, then the values of t are   
    a) ± 2 b) 1,2 c) 2,3 d) ±2
33. C:\Users\tsuser.PC\Desktop\final.pngFind the minimum value of (x-2) (x-9)   
    a) b) c) 0 d)
34. If 4x = 18y, then the value of ( is \_   
    a) 1/3 b) 7/2 c) 2/3 d) 3/2
35. If (x –c)2 + (y -5)2 + (z – d)2 = 0 then the value of + + is -   
    a) 12 b) 9 c) 3 d) 1
36. If + 2P = 12 for what value of P, x = 6 ?   
    a) 6 b) 4 c) 2 d) 1
37. The value of is -   
    a) 5 – 8 b) 5 + 8 c) 8 + 5 d) 8 – 5
38. If x (3 - ) = , then the value of x2 + is -   
    a) 2 b) 2 c) 3 d) 3
39. If ()3 x ()-7 = ()2x than x is   
    a) -2 b) 2 c) 5 d) 2
40. If p – 2q = 4, then the value of p3 – 8q3 – 24pq – 64 is   
    a) 2 b) 0 c) 3 d) -1
41. If = - , then the value of x – x2 is   
    a) –a b) c) - d) a
42. If (x+ ) = 4, then the value of x4 +is   
    a) 64 b) 194 c) 81 d) 124
43. If = , then the value of x3 + is   
    a) 81 b) 110 c) 125 d) 27
44. If = A + , then B – A is   
    a) -13 b) 2 c) 13 d) 3 -
45. If the expression x2 + x + 1 is written in the form (x + )2 + q2, then the possible values of q are   
    a) ± b) ± c) ± d) ±
46. If a2 – 4a – 1 = 0, then value of a2 + + 3a - is   
    a) 25 b) 30 c) 35 d) 40
47. If x = + , then x3 + 3 bx is equal   
    a) 0 b) a c) 2a d) 1
48. If = a + b + c and a, b, c, are rational numbers, then a + b+ c is equal to   
    a) 0 b) 1 c) 2 d) 3
49. 1/1 + 2a-b + 1 / 1 + 2b-a is   
    a) a – b b) b – a c) 1 d) 0
50. If = and , then is equal to   
    a) b) c) d)

**Answers**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 - b | 2 - a | 3 - c | 4 - a | 5 - d | 6 - d | 7 - d | 8 - a | 9 - a | 10 – d |
| 11 - d | 12 - b | 13 - c | 14 – c | 15 – a | 16 – b | 17 – c | 18 – b | 19 – d | 20 – b |
| 21 - b | 22 - c | 23 - b | 24 – b | 25 – c | 26 – a | 27 – c | 28 – d |

**Additional Examples**

1. C:\Users\tsuser.PC\Desktop\final.pngIf x = 2 – 21/3 + 22/3, then the value of x3 – 6x2 + 18x + 18 is   
   a) 22 b) 33 c) 40 d) 45
2. C:\Users\tsuser.PC\Desktop\final.pngIf x = (a b) the value of + is   
   a) a b) b c) 2ab d) 2
3. C:\Users\tsuser.PC\Desktop\final.pngIf x = b + c – 2a, y = c +a -2b, z = a+ b – 2c, then the value of x2 + y2 – z2 + 2xy is   
   a) 0 b) a+ b+c c) a-b+c d) a+b –c
4. C:\Users\tsuser.PC\Desktop\final.pngIf a2+ b2 = 2 and c2 + d2 =1, then the value of (ad – bc) 2 + (ac + bd)2 is   
   a) b) c) 1 d) 2
5. If x + = 5, then is equal to   
   a) 5 b) c) 3 d)
6. C:\Users\tsuser.PC\Desktop\final.pngIf x – y = = , the numerical value of xy is   
   a) b) c) d)
7. C:\Users\tsuser.PC\Desktop\final.pngIf 3x + = 5, then the value of 8x3 + is:   
   a) 118 b) 30 c) 0 d) 1
8. Two numbers x and y (x > y) are such that their sum is equal to three times their difference. The value of () will be :   
   a) b) 1 c) 1 d) 1
9. C:\Users\tsuser.PC\Desktop\final.pngIf p = 99, then value of p(p2 + 3p + 3) is   
   a) 999 b) 9999 c) 99999 d) 999999
10. C:\Users\tsuser.PC\Desktop\final.pngIf p = 101, then the value of is   
    a) 100 b) 101 c) 102 d) 1000
11. If a = and b = , then (a3  + b3) is equal to   
    a) 40 b) 44 c) 48 d) 52
12. C:\Users\tsuser.PC\Desktop\final.pngIf = 2 then x is equal to   
    a) 2.4 b) 3.2 c) 4 d) 5
13. C:\Users\tsuser.PC\Desktop\final.pngIf 1.5x = 0.04 y, then the value of is   
    a) b) c) d)
14. C:\Users\tsuser.PC\Desktop\final.pngThe value of the expression x4 – 17x3 + 17x2 - 17x + 17 at a x = 16 is   
    a) 0 b) 1 c) 2 d) 3
15. If x = value of x3 – 3mx2 + 3x – m is   
    a) 0 b) m - c) m + d) 1
16. C:\Users\tsuser.PC\Desktop\final.pngThe simplest form of the expression ÷ ÷ is   
    a) 2p2 b) c) p+ 3 d)
17. If a+b+c = 4 and a2 + b2 + c2 = 16, then the ratio a :b : c is   
    a) 1 : 1 : 1 b) 1 : : c) 1 : 2 : 3 d) None
18. C:\Users\tsuser.PC\Desktop\final.pngIf 2x = 4y = 8z and xyz = 288, the value of + + is   
    a) b) c) d)
19. C:\Users\tsuser.PC\Desktop\final.pngIf x = …., then the value of x is   
    a) b) c) d)
20. If + = + , b a, then the value of x is   
    a) b) 1 c) d)
21. C:\Users\tsuser.PC\Desktop\final.pngIf x = , then the value of + is   
    a)2 b) 0 c) -2 d) 1
22. If x = 1 + , then the value of (2x4 - 8x3 – 5x2 + 26x – 28) is   
    a) 6 b) 0 c) 3 d) 2
23. If + + = 3, then the value of m is   
    a) a2 + b2 + c2 b) a2 – b2 – c2 c) a2 + b2 – c2 d) a2 + b2
24. If m – 5n = 2, then the value of (m3 – 125n3 – 30mn) is   
    a) 9 b) 7 c) 6 d) 8
25. If x = and y = , then the value of = ?   
    a) b) c) d)

**Answers:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 - c | 2 - d | 3 - a | 4 - d | 5 - b | 6 - a | 7 - b | 8 - b | 9 - d | 10 – a |
| 11 - d | 12 - d | 13 - b | 14 – b | 15 – a | 16 – b | 17 – a | 18 – b | 19 – b | 20 – a |
| 21 - a | 22 - a | 23 - a | 24 – d | 25 – d |