



MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

FACTORISATION OF POLYNOMIALS

Solved Examples

1. Factorize

(i) $5a^2 - 20ab$

(ii) $36a^3b - 60a^2bc$

(iii) $5a(b + c) - 7b(b + c)$

(iv) $6(2a + 3b)^2 - 8(2a + 3b)$



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2. Factorize $x(x - y)^3 + 3x^2y(x - y)$.



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3. Factorize

(i) $ab + bc + ax + cx$

(ii) $x^2 + 3x + x + 3$

(iii) $6ab - b^2 + 12ac - 2bc$

(iv) $a^2 - b - ab - a$



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4. Factorize $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$.



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5. Factorize $1 + x + y - z + xy - yz - zx - xyz$



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6. Factorize $(2x - 3)^2 - 8x + 12$.



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7. Factorize

$$(i) \left(x^2 - \frac{y^2}{100} \right)$$

$$(ii) (100 - 9x^2)$$

$$(iii) \left(49x^2 - \frac{1}{4} \right)$$



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8. Factorize

$$(i) (x^3 - x)$$

$$(ii) 18a^2x^2 - 32$$

$$(iii) (2a^5 - 32a).$$



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9. Factorize

$$(i) x^2 - 1 - 2a - a^2$$

$$(ii) 1 + 2ab - (a^2 + b^2)$$



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10. Factorize

$$(i) (x^4 + 4)$$

$$(ii) \left(x^2 + \frac{4}{x^2} \right)$$

$$(iii) \left(x^4 + \frac{1}{x^4} + 1 \right)$$



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11. Factorize: $x^4 + x^2y^2 + y^4$



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12. Factorize $a(a - 1) - b(b - 1)$.



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13. Factorize (i) $(x^4 + 3x^2 + 4)$

(ii) $(x^4 + 5x^2 + 9)$



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14. Factorize each of the following algebraic expressions : $x^8 - y^8$ (ii) $a^{12}x^4 - a^4x^{12}$

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15. Factorize $\left(2x + \frac{1}{3}\right)^2 - \left(x - \frac{1}{2}\right)^2$.

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16. Factorize : $x^2 + 9x + 18$

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17. Factorize $x^2 + 5x - 24$.



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18. Factorize $x^2 - 4x - 21$.



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19. Factorize

(i) $x^2 + 5\sqrt{3}x + 12$

(ii) $x^2 + 3\sqrt{3}x - 30$



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20. Factorize $(p + q)^2 - 20(p + q) - 125$.



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21. Factorize $a^4 + 4a^2 + 3$.



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22. $6x^2 + 17x + 5 = ?$



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23. $\sqrt{2}x^2 + 9x + 4\sqrt{2}$



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24. $2x^2 + 11x - 21$



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25. Factorize $6x^2 + 7x - 3$.



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26. Factorize $9x^2 - 22x + 8$.



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27. Factorize $35y^2 + 13y - 12$



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28. Factorize each of the following expressions :

$$4\sqrt{3}x^2 + 5x - 2\sqrt{3}$$

$$5\sqrt{5}x^2 + 30x + 8\sqrt{5}$$

$$7\sqrt{2}x^2 - 10x - 4\sqrt{2}$$



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29. Factorize $2x^2 - 7x - 39$.



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30. Factorize $42 - r - r^2$.



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31. $2x^2 - \frac{5}{6}x + \frac{1}{12}$



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32. Factorize: $5(3x + y)^2 + 6(3x + y) - 8$



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33. Factorize $x^4 - 3x^2 + 2$.



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34. Factorize of the expression:

$$7\sqrt{2}x^2 - 10x - 4\sqrt{2}$$



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35. Factorize of the expression: $5\sqrt{5}x^2 + 30x + 8\sqrt{5}$



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36. Factorize $4x^2 + 20x + 25$.



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37. Expand $(2a + 3b + 4c)^2$.



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38. Expand the following

(i) $(4a - b + ac)^2$ (ii) $(3a - 5b - c)^2$

(iii) $(-x + 2y - 3z)^2$



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39.

Factorize

$$9x^2 + 4y^2 + 16z^2 + 12xy - 16yz - 24xz.$$



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40. Factorise the following :

$$(i) 9x^2 + 4y^2 + 16z^2 + 12xy - 16yz - 24xz$$

$$(ii) 25x^2 + 16y^2 + 4z^2 - 40xy + 16yz - 20xz$$

$$(iii) 16x^2 + 4y^2 + 9z^2 - 16xy - 12yz + 24xz$$



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41.

factorise

$$2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8xz$$



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42. Evaluate (i) 101×102

$$(ii) (999)^2$$

$$(iii) (997)^2$$



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43. Expand (i) $(4a + 5b)^3$

(ii) $(3a - 2b)^3$

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44. Expand the following

(i) $(3a - 2b)^3$ (ii) $\left(\frac{1}{x} + \frac{y}{3}\right)^3$ (iii) $\left(4 - \frac{1}{3x}\right)^2$

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45. Simplify : $(2x - 5y)^3 - (2x + 5y)^3$



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46. Factorise

$$8a^3 + b^3 + 12a^2b + 6ab^2$$



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47. Factorise

(i) $27 - 125a^3 - 135a + 225a^2$

(ii) $1 - 64a^3 - 12a + 48a^2$.



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48. Factorise

$$(i) 8p^3 + \frac{12}{5}p^2 + \frac{6}{25}p + \frac{1}{125}$$

$$(ii) 27p^3 - \frac{9}{2}p^2 + \frac{1}{4}p - \frac{1}{216}$$



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49. Simplify: $(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2)$



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50. Evaluate (i) $(102)^3$

(ii) $(999)^3$



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51. find the following products

$$(i) \left(\frac{x}{2} + 2y \right) \left(\frac{x^2}{4} - xy + 4y^2 \right) (ii)$$

$$(x^2 - 1)(x^4 + x^2 + 1)$$



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52. Factorise

$$(i) 1 + 64x^3$$

$$(ii) 27x^3 + 125y^3$$

$$(iii) (x + 1)^3 + (x - 1)^3$$



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53. Factrise

$$(i) a^3 - 2\sqrt{2}b^3$$

$$(ii) 1 - 64a^3$$

$$(iii) 8a^3 - 27b^3$$



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54. Factrise

$$(i) 2a^7 - 128a$$

$$(ii) a^7 + ab^6$$

$$(iii) 32a^3 + 108b^3$$



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55. Factroise

$$(i) a^3 + b^3 + a + b$$

$$(ii) a^3 - b^3 - a + b$$



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56. Factroise $(a^6 - b^6)$



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57. Factorize: $x^6 - 7x^3 - 8$



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58. Factorize: $x^3 + 3x^2 + 3x - 7$



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59. If $x + y = 12$ and $xy = 27$; find the value of $x^3 + y^3$



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60. Factorise $(2a + 3b)^3 - (2a - 3b)^3$.



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61. Find the product:

$$(2x - y + 3z)(4x^2 + y^2 + 9z^2 + 2xy + 3yz - 6xz)$$



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62. Multiply: $x^2 + 4y^2 + z^2 + 2xy + xz - 2yz$ by

$$x - 2y - z$$



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63. $8x^3 + y^3 + 27z^3 - 18xyz$



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64. Factorise $a^3 - 8b^3 - 64c^3 - 24abc$



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65. Factorize : $2\sqrt{2}a^3 + 8b^3 - 27c^3 + 18\sqrt{2}abc$



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66. Factorise $a^3 - b^3 + 1 + 3ab.$



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67. If $a + b + c = 5$ and $ab + bc + ca = 10$, then prove that $a^3 + b^3 + c^3 - 3abc = -25$.

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68. Factorize : $(x - 2y)^3 + (2y - 3z)^3 + (3z - x)^3$

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69. Factorise $(p - q)^3 + (q - r)^3 + (r - p)^3$.

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70. without actually calculating , the cubes , find the value of

(i) $\left(\frac{1}{2}\right)^3 + \left(\frac{1}{3}\right)^3 - \left(\frac{5}{6}\right)^3$ (ii)
 $(0.2)^3 - (0.3)^3 + (0.1)^3$



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71. Find the value of

$x^3 + y^3 - 12xy + 64$, when $x + y = -4$



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72. Find the value of $x^3 - 8y^3 - 36xy - 216$, when $x = 2y + 6$.



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73. If $p = 2 - a$; prove that $a^3 + 6ap + p^3 - 8 = 0$



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74. Two numbers b and c are chosen at random with replacement from the numbers 1, 2, 3, 4, 5, 6, 7, 8 and 9. Find the probability that $x^2 + bx + c > 0$ for all $x \in \mathbb{R}$.



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75. Simplify:
$$\frac{(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3}{(a - b)^3 + (b - c)^3 + (c - a)^3}$$



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Exercise 3 A

1. $9x^2 + 12xy$



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2. $18x^2y - 24xyz$



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3. $27a^3b^3 - 45a^4b^2$



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4. $2a(x + y) - 3b(x + y)$



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$$5. 2x(p^2 + q^2) + 4y(p^2 + q^2)$$



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$$6. x(a - 5) + y(5 - a)$$



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$$7. 4(a + b) - 6(a + b)^2$$



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8. $8(3a - 2b)^2 - 10(3a - 2b)$



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9. Factorize $x(x - y)^3 + 3x^3 + 3x^3y(x - y)$.



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10. $x^3 + 2x^2 + 5x + 10$



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11. Factorize: $x^2 + xy - 2xz - 2yz$



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12. $a^3b - a^2b + 5ab - 5b$



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13. factorise : $8 - 4a - 2a^3 + a^4$



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14. Factorise : $x^3 + 3xy^2 - 2x^2y - 6y^3$



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15. Factorise : $px - 5q - 5x + pq$



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16. Factorise : $x^2 + y - xy - x$



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17. factorize (a) $(3a - 1)^2 - 6a + 2$



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18. Factorise : $(2x - 3)^2 - 8x + 12$



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19. Factorise : $a^3 + a - 3a^2 - 3$



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20. $3ax - 6ay - 8by + 4bx$



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21. Factorise : $abx^2 + a^2x + b^2x + ab$



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22. $x^3 - x^2 + ax + x - a - 1$



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23. Factorise $2x + 4y - 8xy - 1$



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24. $ab(x^2 + y^2) - xy(a^2 + b^2)$



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25. factorize the given expression

$$a^2 + ab(b + 1) + b^3$$



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26. factorize the given expression

$$a^3 + ab(1 - 2a) - 2b^2$$



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27. factorize : $2a^2 + bc - 2ab - ac$



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28. $(ax + by)^2 + (bx - ay)^2$



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29. $a(a + b - c) - bc$



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30. Factorise : $a(a - 2b - c) + 2bc$



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31. Factorise : $a^2x^2 + (ax^2 + 1)x + a$



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32. factorize : $ab(x^2 + 1) + x(a^2 + b^2)$



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33. factorize : $x^2 - (a + b)x + ab$



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34. Factorize $\left(x^2 + \frac{1}{x^2} - 2 - 3x + \frac{3}{x}\right)$



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1. $9x^2 - 16y^2$



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2. Factorise : $\left(\frac{25}{4}x^2 - \frac{1}{9}y^2 \right)$



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3. Factorise : $81 - 16x^2$



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4. Factorize $5 - 20x^2$



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5. Factorize $2x^3 - 48x$



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6. Factorise : $3a^3b - 243ab^3$



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7. Factorize $3x^3 - 48x$



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8. Factorise $27a^2 - 48b^2$



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9. $x - 64x^3$



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10. factorize : $8ab^2 - 18a^3$



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11. Factorize $150 - 6x^2$



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12. $2 - 50x^2$



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13. factorize : $20x^2 - 45$



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14. factorize : $(3a + 5b)^2 - 4c^2$



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15. Factorise : $a^2 - b^2 - a - b$



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16. Factorize each of the following expressions :

$$4a^2 - 9b^2 - 2a - 3b$$



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17. Factorize: $a^2 - b^2 + 2bc - c^2$



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18. factorize : $4a^2 - 4b^2 + 4a + 1$



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19. factorize : $a^2 + 2ab + b^2 - 9c^2$



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20. factorize : $108a^2 - 3(b - c)^2$



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21. Factorize $(a + b)^3 - a - b$



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22. factorize : $x^2 + y^2 - z^2 - 2xy$



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23. Factorize each of the following expressions :

$$x^2 + 2xy + y^2 - a^2 + 2ab - b^2$$



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24. factorize : $25x^2 - 10x + 1 - 36y^2$



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25. Factorize $a - b - a^2 + b^2$



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26. $a^2 - b^2 - 4ac + 4c^2$

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27. Factorize $9 - a^2 + 2ab - b^2$

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28. Find the solutions of $x^3 - 5x^2 - x + 5$. and the
no. of roots

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29. factorize the given expression

$$1 + 2ab - (a^2 + b^2)$$



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30. factorize the given expression

$$9a^2 + 6a + 1 - 36b^2$$



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31. factorize the given expression $x^2 - y^2 + 6y - 9$



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32. Factorise : $4x^2 - 9y^2 - 2x - 3y$



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33. factorize : $9a^2 + 3a - 8b - 64b^2$



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34. factorize : $x^2 + \frac{1}{x^2} - 3$



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35. Factorize $x^2 - 2 + \frac{1}{x^2} - y^2$



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36. factorize : $x^4 + \frac{4}{x^4}$



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37. Factorize $x^8 - 1$.



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38. Solve $16x^4 - 1 = 0$. Find the value of x



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39. factorize : $81x^4 - y^4$



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40. Find the roots of $x^4 - 625$.



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Exercise 3 C

1. Find the roots of $x^2 + 11x + 30$ if they exist



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2. Find the roots of $x^2 + 18x + 32$ if they exist



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3. factorize : $x^2 + 20x - 69$



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4. factorize $x^2 + 19x - 150$



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5. factorize : $x^2 + 7x - 98$



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6. $x^2 + 2\sqrt{3}x - 24$



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7. $x^2 - 21x + 90$



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8. Factorise $x^2 - 22x + 120$



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9. Factorise : $x^2 - 4x + 3$



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10. $x^2 - 7\sqrt{6}x - 48$



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11. $x^2 + 3\sqrt{3}x + 6$



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12. Factorise $x^2 + 6\sqrt{6}x + 48$.



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13. $x^2 + 5\sqrt{5}x + 30$



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14. Factorise $x^2 - 24x - 180$



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15. $x^2 - 32x - 105$



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16. $x^2 - 11x - 80$ Factorise



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17. Factorise $6 - x - x^2$



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18. Factorize: $x^2 - \sqrt{3}x - 6$



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19. Factorise : $40 + 3x - x^2$



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20. Factorise : $x^2 - 26x + 133$



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21. Factorise : $x^2 - 2\sqrt{3}x - 24$



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22. Factorise : $x^2 - 3\sqrt{5}x - 20$



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23. Factorise : $x^2 + \sqrt{2}x - 24$



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24. Factorize: $x^2 - 2\sqrt{2}x - 30$



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25. $x^2 - x - 156$



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26. factorize the given expression $x^2 - 32x - 105$



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27. factorize the given expression $9x^2 + 18x + 8$



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28. Factorise: $6x^2 + 17x + 12$



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29. factorize the given expression $18x^2 - 15x - 25$



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30. factorize the given expression $2x^2 + 11x - 21$



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31. $15x^2 + 2x - 8$



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32. $21x^2 + 5x - 6$



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33. factorize the given expression $24x^2 - 41x + 12$



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34. factorize the given expression $3x^2 - 14x + 8$



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35. factorize the given expression $2x^2 + 3x - 90$



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36. $\sqrt{5}x^2 + 2x - 3\sqrt{5}$



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$$37. 2\sqrt{3}x^2 + x - 5\sqrt{3}$$



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$$38. 7x^2 + 2\sqrt{14}x + 2 = 0$$



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$$39. 6\sqrt{3}x^2 - 47x + 5\sqrt{3}$$



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40. Factorize: $5\sqrt{5}x^2 + 20x + 3\sqrt{5}$



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41. $\sqrt{3}x^2 + 10x + 8\sqrt{3}$



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42. factorize the given expression $\sqrt{2}x^2 + 3x + \sqrt{2}$



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43. $2x^2 + 3\sqrt{3}x + 3$



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44. factorize the given expression $15x^2 - x - 28$



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45. factorize the given expression $6x^2 - 5x - 21$



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46. factorize the given expression $2x^2 - 7x - 15$



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47. factorize the given expression $5x^2 - 16x - 21$



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48. factorize the given expression $6x^2 - 11x - 35$



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49. factorize the given expression $9x^2 - 3x - 20$



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50. factorize the given expression $10x^2 - 9x - 7$



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51. $x^2 - 2x + \frac{7}{16}$



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52. factorize the given expression $\frac{1}{3}x^2 - 2x - 9$



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53. Factorize: $x^2 + \frac{12}{35}x + \frac{1}{35}$



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54. Factorize: $21x^2 - 2x + \frac{1}{21}$



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$$55. \frac{3}{2}x^2 + 16x + 10$$



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$$56. \frac{2}{3}x^2 - \frac{17}{3}x - 28$$



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$$57. \frac{3}{5}x^2 - \frac{19}{5}x + 4$$



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58. Solve each of the following quadratic equations:

$$2x^2 - x + \frac{1}{8} = 0$$



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59. $2(x + y)^2 - 9(x + y) - 5$



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60. $9(2a - b)^2 - 4(2a - b) - 13$



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$$61. 7(x - 2y)^2 - 25(x - 2y) + 12$$



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$$62. 10\left(3x + \frac{1}{x}\right)^2 - \left(3x + \frac{1}{x}\right) - 3$$



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$$63. 6\left(2x - \frac{3}{x}\right)^2 + 7\left(2x - \frac{3}{x}\right) - 20$$



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$$64. (a + 2b)^2 + 101(a + 2b) + 100$$



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65. $4x^4 + 7x^2 - 2$



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66. Evaluate $\{(999)^2 - 1\}$.



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Exercise 3 D

1. Expand

(i) $(a + 2b + 5c)^2$

(ii) $(2a + b + c)^2$

(iii) $(a - 2b - 3c)^2$



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2. Expand

(i) $(2a - 5b - 7c)^2$

(ii) $(-3a + 4b - 5c)^2$

(iii) $\left(\frac{1}{2}a - \frac{1}{4}b + 2\right)^2$



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3. Factorise: (i)

$$4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz \quad \text{(ii)}$$

$$2x^2 + y^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8xz$$



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4. Factorise

$$9x^2 + 16y^2 + 4z^2 - 24xy + 16yz - 12xz$$



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5. $25x^2 + 4y^2 + 9z^2 - 20xy - 12yz + 30xz$



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6.

Factorise

$$16x^2 + 4y^2 + 9z^2 - 16xy - 12yz + 24xz$$



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7. Evaluate

(i) $(99)^2$

(ii) $(995)^2$

(iii) $(107)^2$



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Exercise 3 E

1. Expand

(i) $(3x + 2)^3$

(ii) $\left(3a + \frac{1}{4b}\right)^3$

(iii) $\left(1 + \frac{2}{3}a\right)^3$



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2. Expand

(i) $(5a - 3b)^3$

(ii) $\left(3x - \frac{5}{x}\right)^3$

(iii) $\left(\frac{4}{5}a - 2\right)^3$



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3. Factorize: $8a^3 + 27b^3 + 36a^2b + 54ab^2$



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4. Factorize: $64a^3 - 27b^3 - 144a^2b + 108ab^2$



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5. Factorise $1 + \frac{27}{125}a^3 + \frac{9a}{5} + \frac{27a^2}{25}$



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6. Factorize: $125x^3 - 27y^3 - 225x^2y + 135xy^2$



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7. Factorise $a^3x^3 - 3a^2bx^2 + 3ab^2x - b^3$



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8. Factorise $\frac{64}{125}a^3 - \frac{96}{25}a^2 + \frac{48}{5}a - 8$



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9. Factorise $a^3 - 12a(a - 4) - 64$

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10. evaluate using suitable identities 1. $(99)^3$ 2. $(103)^3$

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Exercise 3 F

1. $x^3 + 27$

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2. $27a^3 + 64b^3$



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3. $125a^3 + \frac{1}{8}$



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4. $216x^3 + \frac{1}{125}$



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5. $16x^2 + 54x$



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6. $7a^3 + 56b^3$



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7. $x^5 + x^2$



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8. $a^3 + 0.008$



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9. Factorize: $1 - 27 a^3$



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10. $64a^3 - 343$



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11. $x^3 - 512$



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12. $a^3 - 0.064$



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13. $8x^3 - \frac{1}{27y^3}$



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14. Factorize: $\frac{x^3}{216} - 8y^3$



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15. Factorise : $x - 8xy^3$



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16. $32x^4 - 500x$



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17. $3a^7 - b - 81a^4b^4$



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18. Factorize $x^4y^4 - xy$



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19. $8x^2y^2 - x^5$



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20. Factorize: $1029 - 3x^3$



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21. $x^6 - 729$



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22. Factorize $x^9 - y^9$



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23. Factorise: $(a + b)^3 - (a - b)^3$



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24. Factorise, $a^3 - \frac{1}{a^3} - 2a + \frac{2}{a}$



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25. Factorize: $a^3 + 3a^2b + 3ab^2 + b^3 - 8$



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26. Factorize: $a^3 - \frac{1}{a^3} - 2a + \frac{2}{a}$



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27. $2a^3 + 16b^3 - 5a - 10b$



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28. Factorize: $a^6 + b^6$



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29. $a^{12} - b^{12}$



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30. Factorize: $x^6 - 7x^3 - 8$



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31. $x^3 - 3x^2 + 3x + 7$



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32. $(x + 1)^3 + (x - 1)^3$



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33. $(2a + 1)^3 + (a - 1)^3$



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34. Factorize: $8(x + y)^3 - 27(x - y)^3$



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35. $(x + 2)^3 + (x - 2)^3$



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36. $(x + 2)^3 - (x - y)^3$



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37. Prove that

$$\frac{0.85 \times 0.85 \times 0.85 + 0.15 \times 0.15 \times 0.15}{0.85 \times 0.85 - 0.85 \times 0.15 + 0.15 \times 0.15} = 1.$$



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38. Prove that $\frac{59 \times 59 \times 59 - 9 \times 9 \times 9}{59 \times 59 + 59 \times 9 + 9 \times 9} = 50$.



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Exercise 3 G

1. Find the product.

$$(x + y - z)(x^2 + y^2 + z^2 - xy + yz + zx)$$



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2. Find the product.

$$(x - y - z)(x^2 + y^2 + z^2 + xy - yz + xz)$$



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3. Find the product.

$$(x - 2y + 3)(x^2 + 4y^2 + 2xy + 6y - 3x + 9)$$



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4. Find the product.

$$(3x - 5y - 4)(9x^2 + 25y^2 + 15xy - 20y + 12x + 16)$$



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5. Factorise: $125a^3 + b^3 + 64c^3 - 60abc$



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6. Factorise: $a^3 + 8b^3 + 64c^3 - 24abc$



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7. Factorise: $1 + b^3 + 8c^3 - 6bc$



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8. Factorise: $216 + 27b^3 + 8c^3 - 108bc$



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9. Factorise: $27a^3 - b^3 + 8c^3 + 18abc$



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10. Factorise: $8a^3 + 125b^3 - 64c^3 + 120abc$



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11. Factorise: $8 - 27b^3 - 343c^3 - 126bc$



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12. Factorise: $125 - 8x^3 - 27y^3 - 90xy$



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13. $2\sqrt{2}a^3 + 16\sqrt{2}b^3 + c^3 - 12abc$



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14. Factorize $27x^3 - y^3 - z^3 - 9xyz$



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15. $2\sqrt{2}a^3 + 3\sqrt{3}b^3 + c^3 - 3\sqrt{6}abc$



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16. Factorize: $3\sqrt{3}a^3 - b^3 - 5\sqrt{5}c^3 - 3\sqrt{15}abc$



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17. $(a - b)^3 + (b - c)^3 + (c - a)^3$



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18. Factorize: $(a - 3b)^3 + (3b - c)^3 + (c - a)^3$



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19. $(3a - 2b)^3 + (2b - 5c)^3 + (5c - 3a)^3$



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20. $(5a - 7b)^3 + (7b - 9c)^3 + (9c - 5a)^3$



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21. $a^3(b - c)^3 + b^3(c - a)^3 + c^3(a - b)^3$

A. $3abc$

B. $3abc(b - c)(c - a)(a - b)$

C. $3(b - c)(c - a)(a - b)$

D. none of these

Answer: B



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22. Evaluate

(i) $(-12)^3 + 7^3 + 5^3$

$$(ii)(28)^3 + (-15)^3 + (-13)^3$$



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23.

Prove

that

$$:(a + b + c)^3 - a^3 - b^3 - c^3 = 3(a + b)(b + c)(c + a)$$



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24. If a, b, c are all non zero and $a + b + c = 0$,

prove that

$$\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = 3.$$



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25. If $a + b + c = 9$ and $a^2 + b^2 + c^2 = 35$, find the value of $(a^3 + b^3 + c^3 - 3abc)$.



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Multiple Choice Questions Mcq

1. If $(x + 1)$ is a factor of the polynomial $(2x^2 + kx)$ then the value of k is

A. -2

B. -3

C. 2

D. 3

Answer: C



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2. The value of $(249)^2 - (248)^2$ is

A. 1^2

B. 477

C. 487

D. 497

Answer: D



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3. If $\frac{x}{y} + \frac{y}{x} = -1$, where $x, y \neq 0$ then the value of $(x^3 - y^3)$ is

A. 1

B. -1

C. 0

D. $\frac{1}{2}$

Answer: C



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4. If $a + b + c = 0$ then $(a^3 + b^3 + c^3)$ is

A. 0

B. abc

C. $2abc$

D. $3abc$

Answer: D



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5. If $\left(3x + \frac{1}{2}\right)\left(3x - \frac{1}{2}\right) = 9x^2 - p$ then the value of p is

A. 0

B. $-\frac{1}{4}$

C. $\frac{1}{4}$

D. $\frac{1}{2}$

Answer: C



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6. The coefficient of x in the expression of $(x + 3)^3$ is

A. 1

B. 9

C. 18

D. 27

Answer: D



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7. Which of the following is a factor of

$$(x + y)^3 - (x^3 + y^3)?$$

A. $x^2 + y^2 + 2xy$

B. $x^2 + y^2 - xy$

C. xy^2

D. $3xy$

Answer: D



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8. One of the factors of $(25x^2 - 1) + (1 + 5x)^2$ is

A. $5 + x$

B. $5 - x$

C. $5x - 1$

D. $10x$

Answer: D



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9. If $(x + 5)$ is a factor of $p(x) = x^3 - 20x + 5k$

then $k = ?$

A. -5

B. 5

C. 3

D. -3

Answer: B



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10. If $(x + 2)$ and $(x - 1)$ are factors of $(x^3 + 10x^2 + mx + n)$ then

A. $m = 5, n = -3$

B. $m = 7, n = -18$

C. $m = 17, n = -8$

D. $m = 23, n = -19$

Answer: B





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11. $(104 \times 96) = ?$

A. 9894

B. 9984

C. 9684

D. 9884

Answer: B



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12. $(305 \times 308) = ?$

A. 94940

B. 93840

C. 93940

D. 94840

Answer: C



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13. $(207 \times 193) = ?$

A. 39851

B. 39951

C. 93940

D. 38951

Answer: B



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14. $4a^2 + b^2 - 4ab + 8a - 4b + 4 = ?$

A. $(2a + b + 2)^2$

B. $(2a - b + 2)^2$

C. $(a + 2b + 2)^2$

D. None of these

Answer: B



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15. $(x^2 - 4x - 21) = ?$

A. $(x - 7)(x - 3)$

B. $(x + 7)(x - 3)$

C. $(x - 7)(x + 3)$

D. None of these

Answer: C



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16. $(4x^2 + 4x - 3) = ?$

A. $(2x - 1)(2x - 3)$

B. $(2x + 1)(2x - 3)$

C. $(2x + 3)(2x - 1)$

D. None of these

Answer: C



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17. $6x^2 + 17x + 5 = ?$

A. $(2x + 1)(3x + 5)$

B. $(2x + 1)(2x - 3)$

C. $(6x + 5)(x + 1)$

D. None of these

Answer: B



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18. $(x + 1)$ is a factor of the polynomial

A. $x^3 - 2x^3 + x + 2$

B. $x^3 + 2x^2 + x - 2$

C. $(x^3 + 2x^2 - x - 2$

D. $x^3 + 2x^2 - x + 2$

Answer: C



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19. Factorise $3x^3 + 2x^2 + 3x + 2 = ?$

A. $(3x - 2)(x^2 - 1)$

B. $(3x - 2)(x^2 + 1)$

C. $(3x + 2)(x^2 - 1)$

D. $(3x + 2)(x^2 + 1)$

Answer: D



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20. If $a + b + c = 0$ then $\left(\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}\right) = ?$

A. 1

B. 0

C. -1

D. 3

Answer: D



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21. If $x + y + z = 9$ and $xy + yz + zx = 23$, the value of $(x^3 + y^3 + z^3 - 3xyz) = ?$

A. 108

B. 207

C. 669

D. 729

Answer: A





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22. If $\frac{a}{b} + \frac{b}{a} = -1$ then $(a^3 - b^3) = ?$

A. -3

B. -2

C. -1

D. 0

Answer: D



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