MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

FACTORIZATION OF ALGEBRAIC EXPRESSIONS

Others

1. Factorize each of the following expressions : $x^4 + y^4$ (ii) $x^4 + 4x^2 + 3$

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2. Factorize : $27a^3 + \frac{1}{64b^3} + \frac{27a^2}{4b} + \frac{9a}{16b^2}$ `

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

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4. Prove that : $\frac{0.87\times 0.87\times 0.87+0.13\times 0.13\times 0.13}{0.87\times 0.87-0.87\times 0.13+0.13\times 0.13}=1$

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5. Factorize each of the following expressions : $54x^6y+2x^3y^4$, $8x^2y^3-x^5$

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6. Factorize each of the following expressions : (i) $x^{12}-y^{12}$ (ii) x^9-y^9

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7. Factorize : (i) $x^3 + 3x^2 + 3x - 7$ (ii) $x^3 - 3x^2 + 3x + 7$ (iii) $x^6 - 7x^3 - 8$

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

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9. Factorize each of the following expressions : (i) $a^6 - b^6$ (ii) $a^6 + b^6$ (iii) $a^7 + ab^6$

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10. Factorize the following expression by splitting the middle term: $9(x - 2y)^2 - 4(x - 2y) - 13$

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11. What are the possible expression for the dimensions of a cuboid whose volume is $2ky^2 + 6ky - 20k$

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

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13. Factorize each of the following expressions : . (i) $(2x - 3y)^3 + (4z - 2x)^3 + (3y - 4z)^3,$ (ii) $2\sqrt{2}a^3 + 16\sqrt{2}b^3 + c^3 - 12abc$

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14. Factorize : $\left(a^2 - b^2\right)^3 + \left(b^2 - c^2\right)^3 + \left(c^2 - a^2\right)^3$

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

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

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18. Factorize each of the following expressions : x^4+x^2+1 (ii) x^4+5x^2+9

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19. Factorize each of the following expressions:

$2p(a-b)+3q(5a-5b)+4r(2a-2b)$

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20. Prove that :

$(a+b)^3+(b+c)^3+(c+a)^3-3(a+b)(b+c)(c+a)=2\left(a^3+b^3+c^3\right.$

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21. Factorize each of the following expressions: (i)

$4a^2+12ab+9b^2-8a-12b$, (ii)$a^2+b^2-2(ab-ac+bc)$

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22. Factorisation by grouping the terms: $\left(x^2+3x\right)^2-5\left(x^2+3x\right)-y\left(x^2+3x\right)+5y$

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23. Factorize each of the following expressions : $4a^2-9b^2-2a-3b$

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

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25. Factorize: (i) $8x^3+27y^3+z^3-18xyz$, (ii) $a^3-8b^3-64c^3-24abc$

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26. Factorize : $64a^3 + 125b^3 + 240a^2b + 300ab^2$

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27. Factorize each of the following expressions :

(i) $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$,

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

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28. Factorize : $\left(x^2 - 4x\right)\left(x^2 - 4x - 1\right) - 20$

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29. Factorize : $p^3(q-r)^3 + q^3(r-p)^3 + r^3(p-q)^3$

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

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31. Factorize : $2\sqrt{2}x^3+3\sqrt{3}y^3+\sqrt{5}(5-3\sqrt{6}xy)$

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32. Prove that :

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

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

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34. Resolve $a^3 - b^3 + 1 + 3ab$ into factors.

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

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36. Factorize each of the following expressions : $x^2 + 2xy + y^2 - a^2 + 2ab - b^2$

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37. Factorize each of the following expressions : $3 - 12(a-b)^2$

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38. Factorize each of the following expressions : $x(x+z)-y(y+z)$

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39. Factorize each of the following expressions : a^2-b^2-a-b

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40. Factorize each of the following expressions : $25x^2-10x+1-36y^2$

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41. Factorize each of the following expressions : $1-2ab-\left(a^2+b^2\right)$

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42. Factorize each of the following expressions:

$ab(a^2+b^2-c^2)+bc(a^2+b^2-c^2)-ca(a^2+b^2-c^2)$

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43. Factorize each of the following expressions:

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

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44. Factorize each of the following expressions by splitting the middle term: $2(x+y)^2-9(x+y)-5$

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45. Factorize each of the following expressions by splitting the middle term: $8(a+1)^2+2(a+1)(b+2)-15(b+2)^2$

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46. Factorize each of the following expressions: (a)

$2p(a-b)+3q\,(5a-5b)+4r(2b-2a)$ (b)

$ab\left(a^2+b^2-c^2\right)+bc\left(a^2+b^2-c^2\right)-ca\left(a^2+b^2-c^2\right)$ (c)

$x\left(x^2+y^2-z^2\right)+y\left(-x^2-y^2+z^2\right)-z\left(x^2+y^2-z^2\right)$

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47. Factorize of the expression: $a^3x+a^2(x-y)-a(y+z)-z$

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48. Factorisation by grouping the terms:

$\left(x^2+3x\right)^2-5\left(x^2+3x\right)-y\left(x^2+3x\right)+5y$

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49. Factorize each of the following expressions:

(i)$4a^2 + 12ab + 9b^2 - 8a - 12b$,

(ii)$a^2 + b^2 - 2(ab - ac + bc)$

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50. Factorize each of the following expressions:

$(i)\left(5x - \frac{1}{x}\right)^2 + 4\left(5x - \frac{1}{x}\right) + 4,\ x \neq 0$

$(ii)4(x+y)^2 - 28y(x+y) + 49y^2$

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

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51. Factorise:

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

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

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52. Factorize each of the following algebraic expressions :

(i)$x^8 - y^8$

(ii) $a^{12}x^4 - a^4x^{12}$

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

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54. Factorize each of the following expressions:

(i)$4a^2 - 9b^2 - 2a - 3b$

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

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55. Factorize each of the following expressions: (i)$3-12(a-b)^2$ (ii) $x(x+z)-y(y+z)$

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56. Factorize each of the following expressions: (a) a^2-b^2-a-b (b) $25x^2-10x+1-36y^2$ (c)$1-2ab-\left(a^2+b^2\right)$

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57. Factorize each of the following expressions : (i)x^4+2x^2+1

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58. Factorize each of the following rational expressions:

(i)x^4-4

(ii) x^4+4x^2+3

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59. Factorize the splitting the middle term: $x^2 + 3\sqrt{3}x + 6$

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60. Factorize the splitting the middle term: $x^2 + 3\sqrt{3}x + 6$

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61. Factorize : $\left(x^2 - 4x\right)\left(x^2 - 4x - 1\right) - 20$

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62. Factorize each of the following expressions :

(i) $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$,

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

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

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64. Factorize of the expression: $7\sqrt{2}\,x^2 - 10x - 4\sqrt{2}$

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65. Factorize each of the following expressions by splitting the middle term: $9(x-2y)^2 - 4(x-2y) - 13$

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66. Factorize each of the following expressions by splitting the middle term: $2(x+y)^2 - 9(x+y) - 5$

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67. Factorize each of the following expressions by splitting the middle term: $8(a+1)^2+2(a+1)(b+2)-15(b+2)^2$

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68. Give possible expressions for the length and breadth of the rectangle whose area is $25a^2-35a+12$.

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69. What are the possible expressions for the dimensions of a cuboid whose volume is $2ky^2+6ky-20k$.

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70. Factorize: x^3+x-3x^2-3

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71. Factorize : $a(a+b)^3 - 3a^2b(a+b)$

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72. Factorize: $x\left(x^3 - y^3\right) + 3xy(x-y)$

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73. Factorize: $x^3 - 2x^2y + 3xy^2 - 6y^3$

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74. Factorize: $6ab - b^2 + 12ac - 2bc$

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75. Factorize: $\left(x^2+\frac{1}{x^2}\right)-4\left(x+\frac{1}{x}\right)+6$

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76. Factorize: $x(x-2)(x-4)+4x-8$

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77. Factorize: $(x+2)\left(x^2+25\right)-10x^2-20x$

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78. Factorize: $2a^2+2\sqrt{6}ab+3b^2$

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79. Factorize: $(a-b+c)^2+(b-c+a)^2+2(a-b+c)(b-c+a)$

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80. Factorize: $a^2 + b^2 + 2(ab + bc + ca)$

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81. Factorize: $4(x - y)^2 - 12(x - y)(x + y) + 9(x + y)^2$

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82. Factorize: $a^2 - b^2 + 2bc - 2ac$

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83. Factorize: $a^2 + 2ab + b^2 - c^2$

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84. Factorize: $a^2 + 4b^2 - 4ab - 4c^2$

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85. Factorize: $xy^9 - yx^9$

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

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87. Factorize: $x^2 + y^2 - 2xy - 4z^2$

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88. Factorize: $x^2 + 6\sqrt{2}\,x + 10$

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

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

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91. Factorize: $x^2 + 5\sqrt{5}\,x + 30$

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92. Factorize: $x^2 + 2\sqrt{3}\,x - 24$

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93. Factorise: $2x^2 - \frac{5}{6}x + \frac{1}{12}$

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

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

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

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97. Factorize: $2x^2 + 3\sqrt{5}\,x + 5$

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98. Factorize : $9(2a-b)^2-4(2a-b)-13$

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99. Factorize : $7(x-2y)^2-25(x-2y)+12$

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100. Factorize each of the following expressions by splitting the middle term: $2(x+y)^2-9(x+y)-5$

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101. Give possible expressions for the length and breadth of each of the following rectangles, in which their areas are given:

(i) Area: $25a^2 - 35a + 12$

(ii) Area: $35y^2 + 13y - 12$

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102. What are the possible expressions for the dimensions of the cuboid whose volume is $3x^2 - 12x$.

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103. Factorize : $a^3 + 27$

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104. Factorize: $27a^3 + 125b^3$

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105. Factorize: $(2a+1)^3 + (a-1)^3$

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106. Factorize: $a^3 - 0.216$

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107. Factorize: $p^6 - 512q^6$

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108. Factorize: $(x+1)^3 - (x-1)^3$

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109. Factorize: $(x+1)^3 + (x-1)^3$

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

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111. Factorize: $a^6 - b^6$

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

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113. Factorize: $a^7 + ab^6$

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114. Factorize each of the following expressions : $x^{12} - y^{12}$ (ii) $x^9 - y^9$

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115. Factorize each of the following expressions : $x^{12} - y^{12}$ (ii) $x^9 - y^9$

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

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

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

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119. Prove that :

(0.87 x 0.87 x 0.87+0.13 x 0.13 x 0.13) / (0. 87 x 0.87-0.87 x 0.13+0.13 x 0.13)=1

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120. Factorize: $p^3 + 27$

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121. Factorize: $y^3 + 125$

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122. Factorize: $1 - 27\,a^3$

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123. Factorize: $8x^3y^3 + 27a^3$

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124. Factorize: $64a^3 - b^3$

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

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126. Factorize: $10x^4y - 10xy^4$

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127. Factorize: $54x^6y + 2x^3y^4$

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128. Factorize: $32a^3 + 108b^3$

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129. Factorize: $(a - 2b)^3 - 512b^3$

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130. Factorize: $(a + b)^3 - 8(a - b)^3$

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131. Factorize: $(x + 2)^3 + (x - 2)^3$

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132. Factorise $8x^2y^3 - x^5$

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

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134. Factorize: $x^6 + y^6$

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135. Factorize: $x^3y^3 + 1$

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136. Factorize: $x^4y^4 - xy$

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137. Factorize: $a^{12} + b^{12}$

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138. Factorize: $x^3 + 6x^2 + 12x + 16$

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139. Factorize: $a^3 + b^3 + a + b$

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

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

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142. Factorize: $8a^3 - b^3 - 4ax + 2bx$

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143. Simplify: $\frac{173 \times 173 \times 173 + 127 \times 127 \times 127}{173 \times 173 - 173 \times 127 + 127 \times 127}$

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144. Simplify: $\frac{155 \times 155 \times 155 - 55 \times 55 \times 55}{155 \times 155 + 155 \times 55 + 55 \times 55}$

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145. Simplify: $\frac{1.2 \times 1.2 \times 1.2 - 0.2 \times 0.2 \times 0.2}{1.2 \times 1.2 + 1.2 \times 0.2 + 0.2 \times 0.2}$

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146. Factorize: $8a^3 + b^3 + 12a^2b + 6ab^2$

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147. Factorize: $8a^3 - b^3 - 12a^2b + 6ab^2$

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148. Factorize: $27 - 125a^3 - 135a + 225a^2$

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

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150. Factorize: $27\,p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$

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151. Factorize : $27a^3 + \frac{1}{64b^3} + \frac{27a^2}{4b} + \frac{9a}{16b^2}$ `

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152. Factorize: $\frac{64}{125}x^3 - 8 - \frac{96}{25}x^2 + \frac{48}{5}x$

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

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154. Factorize: $64a^3 + 125b^3 + 240a^2b + 300ab^2$

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

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156. Factorize: $\frac{8}{27}x^3 + 1 + \frac{4}{3}x^2 + 2x$

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157. Factorise $8x^3 + 27y^3 + 36x^2y + 54xy^2$.

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

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159. Factorize: $x^3 + 8y^3 + 6x^2y + 12xy^2$

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160. Factorize: $x^3 + 8y^3 + 6x^2y + 12xy^2$

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

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

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163. Factorize: $x^3 - 12x(x-4) - 64$

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164. Factorize: $a^3x^3 - 3a^2bx^2 + 3ab^2x - b^3$

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165. Factorize: $8x^3 + 27y^3 + z^3 - 18xyz$

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166. Factorize: $a^3 - 8b^3 - 64c^3 - 24abc$

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

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168. Resolve $a^3 - b^3 + 1 - 3ab$ into factors.

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

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170. Prove that :

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

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171. Prove that :

$$(a+b)^3 + (b+c)^3 + (c+a)^3 - 3(a+b)(b+c)(c+a) = 2\big(a^3 + b^3 + c^3$$

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172. Factorize : $2\sqrt{2}x^3 + 3\sqrt{3}y^3 + \sqrt{5}\left(5 - 3\sqrt{6}xy\right)$

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173. Find the product: $(a - b - c)\left(a^2 + b^2 + c^2 + ab + ac - bc\right)$

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174. Find the product:

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

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

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176. Factorize : $p^3(q-r)^3+q^3(r-p)^3+r^3(p-q)^3$

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177. Factorize : $\left(a^2-b^2\right)^3+\left(b^2-c^2\right)^3+\left(c^2-a^2\right)^3$

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

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

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180. Find the value of $(x-a)^3+(x-b)^3+(x-c)^3-3(x-a)(x-b)(x-c)$ when $a+b+c=3x$

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

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

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183. Factorize: $a^3+8b^3+64c^3-24abc$

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184. Factorize: $x^3 - 8y^3 + 27z^3 + 18xyz$

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

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186. Factorize: $\frac{1}{27}x^3 - y^3 + 125z^3 + 5xyz$

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187. Factorize: $8x^3 + 27y^3 - 216z^3 + 108xyz$

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188. Factorize: $125 + 8x^3 - 27y^3 + 90xy$

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189. Factorize: $(3x-2y)^3+(2y-4z)^3+(4z-3x)^3$

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190. Factorize: $(2x-3y)^3+(4z-2x)^3+(3y-4z)^3$

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191. Factorize:

$$\left(\frac{x}{2}+y+\frac{z}{3}\right)^3+\left(\frac{x}{3}-\frac{2y}{3}+z\right)^3+\left(-\frac{5x}{6}-\frac{y}{3}-\frac{4z}{3}\right)^3$$

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

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

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

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195. Factorize: $8x^3 - 125y^3 + 180xy + 216$

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

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197. Find the value of $x^3 + y^3 - 12xy + 64, \ \ when \ \ x + y = \ -4$

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

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

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200. Multiply: $x^2 + 4y^2 + 2xy - 3x + 6y + 9$ by $x - 2y + 3$

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201. Multiply: $9x^2 + 25y^2 + 15xy - 12x + 20y + 16$ by $3x - 5y + 4$

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202. Factorize: $x^4 - 24x^2 - 25 = 0.$

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203. Factorize: $x^2 - 1 - 2a - a^2$

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204. If $a + b + c = 0,$ then write the value of $a^3 + b^3 + c^3$

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205. If $a^2 + b^2 + c^2 = 20 \ and \ a + b + c = 0,$ find $ab + bc + ca$

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206. If $a+b+c=9$ and $ab+bc+ca=40$, find $a^2+b^2+c^2$.

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207. If $a^2+b^2+c^2=250$ and $ab+bc+ca=3$, find $a+b+c$

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208. Write the value of $25^3-75^3+50^3$

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209. Write the value of $48^3-30^3-18^3$

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210. Write the value of $\left(\frac{1}{2}\right)^3+\left(\frac{1}{3}\right)^3-\left(\frac{5}{6}\right)^3$

A. $\frac{5}{12}$

B. $\frac{-5}{12}$

C. $\frac{1}{12}$

D. $\frac{-1}{12}$

Answer: B

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211. Write the value of $30^3 + 20^3 - 50^3$

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212. The factors of $a^2 - 1 - 2x - x^2$ are (a)$(a - x + 1)(a - x - 1)$ (b) $(a + x - 1)(a - x + 1)$ (c)$(a + x + 1)(a - x - 1)$ (d) none of these

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213. The factors of $x^4 - x^2 - 10x - 25$ are (a) $(x^2 + 3x + 5)(x^2 - 3x + 5)$ (b) $(x^2 + 3x + 5)(x^2 + 3x - 5)$ (c) $(x^2 + x + 5)(x^2 - x + 5)$ (d) none of these

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214. The factors of $x^2 + 4y^2 + 4y - 4xy - 2x - 8$ are

(a) $(x - 2y - 4)(x - 2y + 2)$

(b) $(x - y + 2)(x - 4y - 4)$

(c) $(x + 2y - 4)(x + 2y + 2)$

(d) none of these

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215. The factors of $x^3 - x^2y - xy^2 + y^3$ are

(a) $(x + y)(x^2 - xy + y^2)$

(b) $(x + y)(x^2 + xy + y^2)$

(c)$(x+y)^2(x-y)$

(d) $(x-y)^2(x+y)$

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216. The factors of x^3-1+y^3+3xy are

(a) $(x-1+y)\left(x^2+1+y^2+x+y-xy\right)$

(b)$(x+y+1)\left(x^2+y^2+1-xy-x-y\right)$

(c)$(x-1+y)\left(x^2-1-y^2+x+y+xy\right)$

(d)$3(x+y-1)\left(x^2+y^2-1\right)$

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217. The factors of $8a^3+b^3-6ab+1$ are

(a) $(2a+b-1)\left(4a^2+b^2+1-3ab-2a\right)$

(b)$(2a-b+1)\left(4a^2+b^2-4ab+1-2a+b\right)$

(c)$(2a+b+1)\left(4a^2+b^2+1-2ab-b-2a\right)$

(d)$(2a-1+b)\left(4a^2+1-4a-b-2ab\right)$

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218. $(x+y)^3-(x-y)^3$ can be factorized as

(a) $2y\left(3x^2+y^2\right)$

(b) $2x\left(3x^2+y^2\right)$

(c) $2y\left(3y^2+x^2\right)$

(d)$2x\left(x^2+3y^2\right)$

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219. The factors of x^2-7x+6 are

A. $x(x-6)(x-1)$

B. $\left(x^2-6\right)(x-1)$

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

D. $(x-1)(x+3)\ (x-2)$

Answer: D

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220. The expression $(a-b)^3+(b-c)^3+(c-a)^3$ can be factorized as

(a) $(a-b)(b-c)(c-a)$

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

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

(d) $(a+b+c)\left(a^2+b^2+c^2-ab-bc-ca\right)$

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221. The expression x^4+4 can be factorized as

(a) $\left(x^2+2x+2\right)\left(x^2-2x+2\right)$

(b) $\left(x^2+2x+2\right)\left(x^2+2x-2\right)$

(c) $\left(x^2-2x-2\right)\left(x^2-2x+2\right)$

(d) $\left(x^2+2\right)\left(x^2-2\right)$

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222. If $3x = a + b + c$, then the value of $(x-a)^3 + (x-b)^3 + (x-c)^3 - 3(x-a)(x-b)(x-c)$ is

(a)$a + b + c$

(b) $(a-b)(b-c)(c-a)$

(c)0

(d) None of these

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223. If $(x+y)^3 - (x-y)^3 - 6y(x^2 - y^2) = ky^3$, then $k =$

(a)1

(b) 2

(c) 4

(d) 8

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224. If $x^3 - 3x^2 + 3x + 7 = (x+1)(ax^2 + bx + c)$, then $a + b + c =$

A. 4

B. 12

C. -10

D. 3

Answer: A

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225. The value of $\frac{(2.3)^3 - 0.027}{(2.3)^2 + 0.69 + 0.09}$ is

(a)2

(b) 3

(c) 2.327

(d) 2.273

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

(a)0.006

(b) 0.02

(c) 0.0091

(d) 0.00185

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