MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

ALGEBRAIC IDENTITIES

Others

1. If $x^4 + \frac{1}{x^4} = 47,$ find the value of $x^3 + \frac{1}{x^3}$

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2. If $x^4 + \frac{1}{x^4} = 194,$ find $x^3 + \frac{1}{x^3}, x^2 + \frac{1}{x^2}$ and $x + \frac{1}{x}$

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3. If $x - \frac{1}{x} = 7$, find the value of $x^3 - \frac{1}{x^3}$

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4. 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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5. Find the value of $4x^2 + y^2 + 25z^2 + 4xy - 10yz - 20zx$ when $x = 4, y = 3$ and $z = 2$.

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

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7. If $a+b+c=6$ and $ab+bc+ca=11$, find the value of $a^3+b^3+c^3-3ab\cdot$

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8. Find the following products:

$(x+y+2z)\left(x^2+y^2+4z^2-xy-2yz-2xz\right)$

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9. If $x-\frac{1}{x}=-1$, find the value of $x^2+\frac{1}{x^2}$

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10. If $a^2+b^2+c^2-ab-bc-ca=0$, prove that $a=b=c$

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11. If $9x^2 + 25y^2 = 181$ and $xy = -6$, find the value of $3x + 5y$

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12. if a-b=6 , ab=20 . find $a^3 - b^3$

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13. Write the following in expanded form: $(9x + 2y + z)^2$

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14. Prove that $a^2 + b^2 + c^2 - ab - bc - ca$ is always non-negative for all values of a, b and c ·

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

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16. Simplify : $(a+b+c)^2$

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17. If $x^2+\frac{1}{x^2}=98$, find the value of x^3+1/x^3

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18. Simplify the following:

$7x^3+8y^3-(4x+3y)\left(16x^2-12xy+9y^2\right)$

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19. If $a - b = 6$ and $ab = 20$, find the value of $a^3 - b^3$

A. 576

B. 500

C. 566

D. 560

Answer: A

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20. If $a + b = 10$ and $ab = 21$, find the value of $a^3 + b^3$

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21. If $4x^2 + y^2 = 40$ and $xy = 6$, find the value of $2x + y$.

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22. If $a+b=7$ and $ab=12$, find the value of $\left(a^2-ab+b^2\right)$

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23. If $x^2+\frac{1}{x^2}=83$. find the value of x^3-1/x^3

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24. If $x+y+z=1, xy+yz+zx=-1$ and $xyz=-1$, find the value of $x^3+y^3+z^3$.

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25. Find the following products: (i) $(0.9x+0.7y)\left(0.81x^2-0.63xy+0.49y^2\right)$ (ii)

$$\left(\frac{2x}{5}-\frac{3y}{7}\right)\left(\frac{9y^2}{49}+\frac{4x^2}{25}+\frac{6xy}{35}\right)$$

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26. If $a+b+c=15$ and $a^2+b^2+c^2=83$, find the value of $a^3+b^3+c^3-3abc$

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27. Without actually calculating the cubes. Find the value of each of the following: $(-12)^3+7^3+5^3\,(28)^3+(-15)^3+(-13)^3$

A. 16888

B. 16367

C. 16380

D. 16000

Answer: C

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28. 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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29. If $x-\frac{1}{x}=3+2\sqrt{2}$, find the value of $x^3-\frac{1}{x^3}$

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30. If $x+y=12$ and $xy=32$, find the value of x^2+y^2.

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31. If $3x + 2y = 12$ and $xy = 6$, find the value of $9x^2 + 4y^2$

$(3x + 2y)^2 = 9x^2 + 4y^2 + 12xy$

$144 = 9x^2 + 4y^2 + 12 \times 6$

$144 - 72 = 9x^2 + 4y^2$

$9x^2 + 4y^2 = 72$

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32. If $x + \frac{1}{x} = 6$, find $x^2 + \frac{1}{x^2}$ (ii) $x^4 + \frac{1}{x^4}$ $(x + 1/x)^2 = 6$

$x^2 + \frac{1}{x^2} + 2 = 36$

$x^2 + \frac{1}{x^2} = 36 - 2$

$x^2 + \frac{1}{x^2} = 34$

(ii) $\left(x^2 + \frac{1}{x^2}\right)^2 = x^4 + \frac{1}{x^4} + 2$

$\left(x^4 + \frac{1}{x^4}\right) = 34^2 - 2$

$x^4 + \frac{1}{x^4} = 1154$

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33. If $x^2 + \frac{1}{x^2} = 27$, find the values of each of the following: $x + \frac{1}{x}$

(ii) $x - \frac{1}{x}\, x^2 + \frac{1}{x^2} = (x + 1/x)^2 - 2$

$(x + 1/x)^2 = 27 + 2 = 29$

$(x + 1/x) = \sqrt{29}$

(ii) $\left(x - \frac{1}{x}\right)^2 + 2 = x^2 + \frac{1}{x^2}$

$(x - 1/x)^2 = 27 - 2$

$(x - 1/x) = 5$

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34. Find the products: (i) $(2x + 3y)(2x - 3y)$

(ii)$(x - 1)(x + 1)\left(x^2 + 1\right)\left(x^4 + 1\right)$

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35. Without calculating the actual cube find the value of $(-12)^3 + 7^3 + 5^3$and $28^3 + (-15)^3 + (-13)^3$

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36. Expand each of the following: (i)$(3x + 4y)^2$ (ii) $(3x - 4y)^2$

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37. If $x - \frac{1}{x} = 3$, find the value of $x^3 - \frac{1}{x^3}$

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38. If $2x + 3y = 13$ and $xy = 6$, find the value of $8x^3 + 27y^3$

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39. If $a + b = 10$ and $a^2 + b^2 = 58$, find the value of $a^3 + b^3$

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40. If $x + \frac{1}{x} = 7$, find the value of $x^3 + \frac{1}{x^3}$

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41. Simplify each of the following expressions: (i) $(x+y+z)^2 + \left(x + \frac{y}{2} + \frac{z}{3}\right)^2 - \left(\frac{x}{2} + \frac{y}{3} + \frac{z}{4}\right)^2$ (ii) $(x+y-2z)^2 - x^2 - y^2 - 3z^2 + 4xy$

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

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42. Simplify each of the following: $(4x+2y)^2 + (4x-2y)^2$

$(4x+2y)^3 - (4x-2y)^2$

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

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44. Prove that:

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

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45. Expand each of the following (i) $(3x + 4y)^2$ (ii) $(3x - 4y)^2$

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46. Expand each of the following

(i) $\left(\sqrt{2}x - 3y\right)^2$

(ii) $\left(2x - \frac{1}{3x}\right)^2$

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47. Expand each of the following (i) $\left(\frac{x}{2}-\frac{y}{3}\right)^2$ (ii) $(x+5)(x-3)$

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48. Find the products: (i) $(2x+3y)\ (2x-3y)$

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49. Find the products:

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

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50. Find the products: (i) $(2x+y)(2x-y)\left(4x^2+y^2\right)$

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51. Evaluate each of the following by using identities: (i)103×97

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52. Evaluate each of the following by using identities: (i)$(0.99)^2$ (ii) $185 \times 185 - 115 \times 115$

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53. Evaluate each of the following by using identities: (i) $0.54 \times 0.54 - 0.46 \times 0.46$ (ii) 103×107

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54. Evaluate each of the following by using identities: (i)95×96 (ii) 104×96 (iii) 105×106

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55. If $x + \frac{1}{x} = 6$, find : $x^2 + \frac{1}{x^2}$

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56. If $x + \frac{1}{x} = 6$, find : $x^4 + \frac{1}{x^4}$

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57. If $x^2 + \frac{1}{x^2} = 27$, find the value of each of the following: $x + \frac{1}{x}$

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58. If $x^2 + \frac{1}{x^2} = 27$, find the value of each of the following: $x - \frac{1}{x}$

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59. If $x + y = 12$ and $xy = 32$, find the value of $x^2 + y^2$

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60. If $3x + 2y = 12$ and $xy = 6$, find the value of $9x^2 + 4y^2$

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61. If $4x^2 + y^2 = 40$ and $xy = 6$, find the value of $2x + y$

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62. Prove that:

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

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63. If : $a^2 + b^2 + c^2 - ab - bc - ca = 0$, prove that $a = b = c$

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64. Evaluate each of the following using identities:

(i) $\left(2x - \frac{1}{x}\right)^2$

(ii) $(2x + y)(2x - y)$

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65. Evaluate each of the following using identities: $\left(a^2b - b^2a\right)^2$ (ii) $(a - 0.1)(a + 0.1)$

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66. Evaluate each of the following using identities: $\left(1.5x^2 - 0.3y^2\right)\left(1.5x^2 + 0.3y^2\right)$

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67. Evaluate each of the following using identities: (i)$(399)^2$(ii) $(0.98)^2$

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68. Evaluate each of the following using identities: (i)991×1009 (ii) 117×83

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69. Simplify each of the following: $175 \times 175 + 2 \times 175 \times 25 + 25 \times 25$

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70. Simplify each of the following: $0.76 \times 0.76 + 2 \times 0.76 \times 0.24 + 0.24 \times 0.24$

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71. Simplify each of the following: $\frac{7.83 \times 7.83 - 1.17 \times 1.17}{6.66}$

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72. If $x + \frac{1}{x} = 11$, find the value of $x^2 + \frac{1}{x^2}$

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73. If $x - \frac{1}{x} = -1$, find the value of $x^2 + \frac{1}{x^2}$

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74. If $x + \frac{1}{x} = \sqrt{5}$, find the values of $x^2 + \frac{1}{x^2}$ and $x^4 + \frac{1}{x^4}$

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75. If $x^2 + \frac{1}{x^2} = 66$, find the value of $x - \frac{1}{x}$

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76. If $x^2 + \frac{1}{x^2} = 79$, find the value of $x + \frac{1}{x}$

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77. If $9x^2 + 25y^2 = 181$ *and* $xy = -6$, find the value of $3x + 5y$

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78. If $2x + 3y = 8$ and $xy = 2$, find the value of $4x^2 + 9y^2$

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79. If $3x - 7y = 10$ and $xy = -1$, find the value of $9x^2 + 49y^2$

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80. Simplify each of the products:

$$\left(\frac{1}{2}a - 3b\right)\left(\frac{1}{2}a + 3b\right)\left(\frac{1}{4}a^2 + 9b^2\right)$$

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81. Simplify each of the products: $\left(m + \frac{n}{7}\right)^3\left(m - \frac{n}{7}\right)$

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82. Simplify each of the products: $\left(\frac{x}{2} - \frac{2}{5}\right)\left(\frac{2}{5} - \frac{x}{2}\right) - x^2 + 2x$

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83. Simplify each of the products: $\left(x^2 + x - 2\right)\left(x^2 - x + 2\right)$

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84. Simplify each of the products: $\left(x^3 - 3x^2 - x\right)\left(x^2 - 3x + 1\right)$

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85. Simplify each of the products: $\left(2x^4 - 4x^2 + 1\right)\left(2x^4 - 4x^2 - 1\right)$

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86. Prove that $a^2 + b^2 + c^2 - ab - bc - ca$ is always non-negative for all values of $a,\ b\ and\ c$

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87. Write the following in expanded form: $(9x + 2y + z)^2$ (ii) $(3x + 2y - z)^2$

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88. Write the following in expanded form: $(x-2y-3z)^2$ (ii) $(-x+2y+z)^2$

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89. Write the following in expanded form: $\left(\frac{1}{4}a-\frac{1}{2}b+1\right)^2$ (ii) $(-2x+5y-3z)^2$

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90. Simplify: $(a+b+c)^2+(a-b-c)^2$

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91. Simplify: $(a+b+c)^2-(a-b-c)^2$

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

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

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

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95. Write the following in the expanded form: $(a + 2b + c)^2$ (ii) $(2a - 3b - c)^2$

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96. Write the following in the expanded form: $(-3x+y+z)^2$ (ii) $(m+2n-5p)^2$

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97. Write the following in the expanded form: $(2+x-2y)^2$ (ii) $\left(a^2+b^2+c^2\right)^2$

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98. Write the following in the expanded form: $(ab+bc+ca)^2$ (ii) $\left(\frac{x}{y}+\frac{y}{z}+\frac{z}{x}\right)^2$

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99. Write the following in the expanded form: $\left(\frac{a}{bc}+\frac{b}{ca}+\frac{c}{ab}\right)^2$

(ii) $(x+2y+4z)^2$

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100. Write the following in the expanded form: $(2x-y+z)^2$ (ii) $(-2x+3y+2z)^2$

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101. Simplify: $(a+b+c)^2+(a-b+c)^2$

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102. Simplify: $(a+b+c)^2-(a-b+c)^2$

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103. Simplify: $(a+b+c)^2 + (a-b+c)^2 + (a+b-c)^2$

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104. Simplify: $(2x+p-c)^2 - (2x-p+c)^2$

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105. Simplify: $\left(x^2+y^2-z^2\right)^2 - \left(x^2-y^2+z^2\right)^2$

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106. If $a+b+c=0$ and $a^2+b^2+c^2=16$, find the value of $ab+bc+ca$

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

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108. If $a + b + c = 9$ and $ab + bc + ca = 23$, find the value of $a^2 + b^2 + c^2$

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109. Find the value of $4x^2 + y^2 + 25z^2 + 4xy - 10yz - 20zx$ when $x = 4,\ y = 3$ and $z = 2$

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110. Simplify : $(x + y + z)^2 + \left(x + \frac{y}{2} + \frac{z}{3}\right)^2 - \left(\frac{x}{2} + \frac{y}{3} + \frac{z}{4}\right)^2$

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111. Simplify: $(x+y-2z)^2 - x^2 - y^2 - 3z^2 + 4xy$

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112. Simplify: $\left(x^2 - x + 1\right)^2 - \left(x^2 + x + 1\right)^2$

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113. Prove that: $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$

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114. Prove that: $(a-b)^3 = a^3 - b^3 - 3ab(a-b)$

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115. Write each of the expanded form: $(2x + 3y)^3$

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116. Write each of the expanded form: $(3x - 2y)^3$

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117. Write each of the expanded form: $\left(\frac{1}{3x} - \frac{2}{5y}\right)^3 \left(\frac{1}{3x} - \frac{2}{5y}\right)^3$

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118. Simplify each : $(4x + 2y)^3 + (4x - 2y)^3$

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119. Simplify each : $(4x+2y)^3 - (4x-2y)^3$

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

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121. If $x-y=4$ and $xy=21$, find the value of x^3-y^3.

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122. If $x+\frac{1}{x}=7$, find the value of $x^3+\frac{1}{x^3}$

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123. If $x - \frac{1}{x} = 3$, find the value of $x^3 - \frac{1}{x^3}$

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124. If $2x + 3y = 13$ and $xy = 6$, find the value of $8x^3 + 27y^3$

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125. If $a + b = 10$ and $a^2 + b^2 = 58$, find the value of $a^3 + b^3$

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126. If $x^2 + \frac{1}{x^2} = 7$, find the value of $x^3 + \frac{1}{x^3}$

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127. If $x^2 + \frac{1}{x^2} = 83$. Find the value of $x^3 - \frac{1}{x^3}$

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128. Evaluate: $(1002)^3$

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129. Evaluate: $(999)^3$

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130. If $x^4 + \frac{1}{x^4} = 47,$ Find the value of $x^3 + \frac{1}{x^3}$

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131. Evaluate: $23^3 - 17^3$

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132. Evaluate: $29^3 - 11^3$

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133. Find the cube of each of the following binomial expressions: (i) $\frac{1}{x} + \frac{y}{3}$ (ii) $\frac{3}{x} - \frac{2}{x^2}$

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134. Find the cube of each of the following binomial expressions: $2x + \frac{3}{x}$ (ii) $4 - \frac{1}{3x}$

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135. Simplify: $(x+3)^3 + (x-3)^3$

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136. Simplify: $\left(\frac{x}{2}+\frac{y}{3}\right)^3 - \left(\frac{x}{2}-\frac{y}{3}\right)^3$

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137. Simplify: $\left(x+\frac{2}{x}\right)^3 + \left(x-\frac{2}{x}\right)^3$

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

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139. If $a + b = 10$ and $ab = 21$, find the value of $a^3 + b^3$

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140. If $a - b = 4$ and $ab = 21$, find the value of $a^3 - b^3$

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141. If $x + \frac{1}{x} = 5$ find the value of $x^3 + \frac{1}{x^3}$

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142. If $x - \frac{1}{x} = 7$ find the value of $x^3 - \frac{1}{x^3}$

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143. If $x - \frac{1}{x} = 5$, find the value of $x^3 - \frac{1}{x^3}$

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144. If $x^2 + \frac{1}{x^2} = 51,$ find the value of $x^3 - \frac{1}{x^3}$

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145. If $x^2 + \frac{1}{x^2} = 98,$ find the value of $x^3 + \frac{1}{x^3}$

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146. If $2x + 3y = 13$ and $xy = 6$, find the value of $8x^3 + 27\,y^3$

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147. If $3x - 2y = 11$ and $xy = 12$, find the value of $27\,x^3 - 8y^3$

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148. If $x^4 + \frac{1}{x^4} = 119,$ find the value of $x^3 - \frac{1}{x^3}$

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149. Evaluate each of the following: $(103)^3$ (ii) $(98)^3$ (iii) $(9.\,9)^3$

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150. Evaluate each of the following: $(10.\,4)^3$ (ii) $(598)^3$ (iii) $(99)^3$

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151. Evaluate each of the following: (i)$111^3 - 89^3$ (ii) $46^3 + 34^3$

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152. Evaluate each of the following: (i)$104^3 + 96^3$ (ii) $93^3 - 107^3$

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153. If $x + \frac{1}{x} = 3$, calculate $x^2 + \frac{1}{x^2}$, $x^3 + \frac{1}{x^3}$ and $x^4 + \frac{1}{x^4}$

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154. If $x^4 + \frac{1}{x^4} = 194$, find $x^3 + \frac{1}{x^3}$, $x^2 + \frac{1}{x^2}$ and $x + \frac{1}{x}$

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155. Find the value of $27x^3 + 8y^3$, if (i)$3x + 2y = 14$ and $xy = 8$ (ii) $3x + 2y = 20$ and $xy = \frac{14}{9}$

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156. Find the value of $64x^3 - 125z^3$, if $4x - 5z = 16$ and $xz = 12$

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157. If $x - \frac{1}{x} = 3 + 2\sqrt{2}$, find the value of $x^3 - \frac{1}{x^3}$

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158. Find the products: $(x + 3y)\left(x^2 - 3xy + 9y^2\right)$

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159. Find the products: $(7a-5b)\left(49a^2+35ab+25b^2\right)$

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160. Find the product: $(0.9x+0.7y)\left(0.81x^2-0.63xy+0.49y^2\right)$

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161. Find the following products:

$(0.9x+0.7y)\left(0.81x^2-0.63xy+0.49y^2\right)$

$\left(\frac{2x}{5}-\frac{3y}{7}\right)\left(\frac{9y^2}{49}+\frac{4x^2}{25}+\frac{6xy}{35}\right)$

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162. Simplify : $7x^3+8y^3-(4x+3y)\left(16x^2-12xy+9y^2\right)$

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163. Simplify: $(6m-n)\left(36m^2+6mm+n^2\right)-(3m+2n)^3$

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164. If $a+b=7$ and $ab=12$, find the value of $\left(a^2+b^2\right)$

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165. If $a+b=10$ and $ab=21$, find the value of a^3+b^3

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166. If $a-b=4$ and $ab=45$, find the value of a^3-b^3

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167. Find the products: $(3x + 2y)(9x^2 - 6xy + 4y^2)$

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168. Find the products: $(4x - 5y)(16x^2 + 20xy + 25y^2)$

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169. Find the products: $(7p^4 + q)(49p^8 - 7p^4q + q^2)$

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170. Find the products: $\left(\frac{x}{2} + 2y\right)\left(\frac{x^2}{4} - xy + 4y^2\right)$

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171. Find the products: $\left(\frac{3}{x}-\frac{5}{y}\right)\left(\frac{9}{x^2}+\frac{25}{y^2}+\frac{15}{xy}\right)$

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172. Find the products: $\left(3+\frac{5}{x}\right)\left(9-\frac{15}{x}+\frac{25}{x^2}\right)$

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173. Find the products: $\left(\frac{2}{x}+3x\right)\left(\frac{4}{x^2}+9x^2-6\right)$

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174. Find the products: $\left(\frac{3}{x}-2x^2\right)\left(\frac{9}{x^2}+4x^4+6x\right)$

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175. Find the products: $(1-x)\left(1+x+x^2\right)$

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176. Find the products: $\left(\frac{3}{x}-2x^2\right)\left(\frac{9}{x^2}+4x^4+6x\right)$

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177. Find the products: $(1-x)\left(1+x+x^2\right)$

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178. Find the products: $(1+x)\left(1-x+x^2\right)$

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179. Find the products: $\left(x^2-1\right)\left(x^4+x^2+1\right)$

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180. Find the products: $\left(x^3+1\right)\left(x^6-x^3+1\right)$

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181. If $x=3\,and\,y=-1,$ find the values of each of the using identity: $\left(9y^2-4x^2\right)\left(81y^4+36x^2y^2+16x^4\right)$

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182. If $x=3\,and\,y=-1,$ find the values of each of the using identity: $\left(\frac{x}{7}+\frac{y}{3}\right)\left(\frac{x^2}{49}+\frac{y^2}{9}-\frac{xy}{21}\right)$

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183. If $x = 3 \, and \, y = -1$, find the values of each of the using identity: $\left(\frac{x}{4} - \frac{y}{3}\right)\left(\frac{x^2}{16} + \frac{xy}{12} + \frac{y^2}{9}\right)$

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184. If $a + b = 10 \; and \; ab = 16$, find the value of $a^2 - ab + b^2 \; and \; a^2 + ab + b^2$

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185. If $a + b = 8 \; and \; ab = 6$, find the value of $a^3 + b^3$

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186. If $a - b = 6 \; and \; ab = 20$, find the value of $a^3 - b^3$

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187. If $x = -2 \, and \, y = 1,$ by using an identity find the value:

$(4y^2 - 9x^2)(16y^4 + 36x^2y^2 + 81x^4)$

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188. Find the product:

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

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189. Evaluate: $30^3 + 20^3 - 50^3$

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190. If $a+b+c=15\ and\ a^2+b^2+c^2=83,$ find the value of $a^3+b^3+c^3-3abc$

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191. Evaluate: $1.\ 5^3-0.\ 9^3-0.\ 6^3$

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192. Without actually calculating the cub: $(-12)^3+7^3+5^3$

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193. Without actually calculating the cub: $(28)^3+(-15)^3+(-13)^3$

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194. If $x+y+z=1,\ xy+yz+zx=-1\ and\ xyz=-1,$ find the value of $x^3+y^3+z^3$

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195. 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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196. Find the product:

$(3x+2y+2z)\ \left(9x^2+4y^2+4z^2-6xy-4yz-6zx\right)$

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197. Find the product:

$(4x - 3y + 2z)\left(16x^2 + 9y^2 + 4z^2 + 12xy + 6yz - 8zx\right)$

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198. Find the product:

$(2a - 3b - 2c)\left(4\,a^2 + 9\,b^2 + 4\,c^2 + 6\,ab - 6\,bc + 4ca\right)$

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199. Find the product:

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

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200. If $x + y + z = 8$ *and* $xy + yz + zx = 20$, find the value of $x^3 + y^3 + z^3 - 3xyz$

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201. If $a + b + c = 9$ *and* $ab + bc + ca = 26$, find the value of $a^3 + b^3 + c^3 - 3abc$

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202. 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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203. Evaluate: $25^3 - 75^3 + 50^3$

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204. Evaluate: $48^3 - 30^3 - 18^3$

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205. Evaluate: $\left(\frac{1}{2}\right)^3 + \left(\frac{1}{3}\right)^3 - \left(\frac{5}{6}\right)^3$

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206. Evaluate: $(0.2)^3 - (0.3)^3 + (0.1)^3$

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207. If $x + \frac{1}{x} = 3$, then find the value of $x^2 + \frac{1}{x^2}$

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208. If $x + \frac{1}{x} = 3$, then the value of $x^6 + \frac{1}{x^6}$ is.

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209. If $a + b = 7 \ and \ ab = 12,$ find the value of $a^2 + b^2$

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210. If $a - b = 5$ and $ab = 12,$ find the value of $a^2 + b^2$

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211. If $x - \frac{1}{x} = \frac{1}{2}$, then write the value of $4x^2 + \frac{4}{x^2}$

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212. If $a^2 + \frac{1}{a^2} = 102$, find the value of $a - \frac{1}{a}$

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213. If $a + b + c = 0$, then write the value of $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}$

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214. If $x + \frac{1}{x} = 5$, then $x^2 + \frac{1}{x^2} = ?$

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215. If $x + \frac{1}{x} = 2$, then $x^3 + \frac{1}{x^3} = ?$ (a)64 (b) 14 (c) 8 (d) 2

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216. If $x+\frac{1}{x}=4$, then $x^4+\frac{1}{x^4}=?$ (a)196 (b) 194 (c) 192 (d) 190

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217. If $x+\frac{1}{x}=3$, then $x^6+\frac{1}{x^6}=?$ (a)927 (b) 414 (c) 364 (d) 322

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218. If $x^4+\frac{1}{x^4}=623$, then $x+\frac{1}{x}=?$ (a)27 (b) 25 (c) $3\sqrt{3}$ (d) $-3\sqrt{3}$

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219. If $x^2+\frac{1}{x^2}=102$, then $x-\frac{1}{x}=?$ (a)8 (b) 10 (c) 12 (d) 13

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220. If $x^3 + \frac{1}{x^3} = 110$, then $x + \frac{1}{x} = ?$ (a)5 (b) 10 (c) 15 (d) none of these

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221. If $x^3 - \frac{1}{x^3} = 14$, then $x - \frac{1}{x} = ?$ (a)5 (b) 4 (d) 3 (d) 2

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222. If $x^4 + \frac{1}{x^4} = 194$, find $x^3 + \frac{1}{x^3}$, $x^2 + \frac{1}{x^2}$ and $x + \frac{1}{x}$

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223. If $x - \frac{1}{x} = \frac{15}{4}$, then $x + \frac{1}{x} = ?$ (a)4 (b) $\frac{17}{4}$ (c) $\frac{13}{4}$ (d) $\frac{1}{4}$

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224. If $3x + \frac{2}{x} = 7$, then $\left(9x^2 - \frac{4}{x^2}\right) = ?$ (a)25 (b) 35 (c) 49 (d) 30

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225. If $a + b + c = 0$, then $\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab} = ?$ (a)0 (b) 1 (c) -1 (d) 3

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226. If $a + b + c = 9$ and $ab + bc + ca = 23$, then $a^2 + b^2 + c^2 = ?$

(a)35 (b) 58 (c) 127 (d) none of these

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227. If $a + b + c = 9$ and $ab + bc + ca = 23$, then $a^3 + b^3 + c^3 - 3abc = ?$ (a)108 (b) 207 (c) 669 (d) 729

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228. $(a-b)^3+(b-c)^3+(c-a)^3=?$ (a) $(a+b+c)\left(a^2+b^2+c^2-ab-bc-ac\right)$ (b) $3(a-b)(b-c)(c-a)$ (c) $(a-b)(b-c)(c-a)$ (d) none of these

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229. 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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230. The product $(a+b)(a-b)\left(a^2-ab+b^2\right)\left(a^2+ab+b^2\right)$ is equal to: (a) a^6+b^6 (b) a^6-b^6 (c) a^3-b^3 (d) a^3+b^3

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231. If $\frac{a}{b}+\frac{b}{a}=-1$, then $a^3-b^3=?$ (a)1 (b) -1 (c) $\frac{1}{2}$ (d) 0

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232. The product $\left(x^2-1\right)\left(x^4+x^2+1\right)$ is equal to: (a)x^8-1 (b) x^8+1 (c) x^6-1 (d) x^6+1

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233. If $a-b=-8$ *and* $ab=-12$, then $a^3-b^3=?$ (a)-244 (b) -240 (c) -224 (d) -260

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234. If the value of a cuboid is $3x^2-27$, then its possible dimensions are (a)$3,\ x^2,\ -27x$ (b) $3,\ x-3,\ x+3$ (c)$3,\ x^2,\ 27x$ (d) $3,\ 3,\ 3$

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235. If $\frac{a}{b}+\frac{b}{a}=1$, then $a^3+b^3=$? (a)1 (b) -1 (c) $\frac{1}{2}$ (d) 0

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236. $75 \times 75-2 \times 75 \times 25+25 \times 25$ is equal to=?

(a)10000 (b) 6250 (c) 7500 (d) 3750

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237. $(x-y)(x+y)\left(x^2+y^2\right)\left(x^4+y^4\right)$ is equal to=

A. $x^{16}-y^{16}$

B. x^8-y^8

C. x^8+y^8

D. $x^{16}+y^{16}$

Answer: B

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238. If $49a^2 - b = \left(7a + \frac{1}{2}\right)\left(7a - \frac{1}{2}\right)$, then the value of $b$is =?

(a)0 (b) $\frac{1}{4}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\frac{1}{2}$

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