

MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

ALGEBRAIC EXPRESSIONS AND IDENTITIES

Others

1. We know that the perimeter P of a square of side s is given by $P = 4 \times s$. find the constant and variable part

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2. The perimeter P of a rectangle of sides l and b is given by $P = 2(l + b)$. evaluate the variable and constant part



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3. $2x^2 - 3xy + 5y^2$ is an algebraic expression. find the terms of the expression



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4. The expression $2x^3 - 3x^2 + 4x - 7$ is an algebraic expression. find the terms of the expression



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5. -5 , $3y$, $7xy$, $\frac{2}{3}x^2yz$, $\frac{5}{3}a^2bc^3$ etc. are all monomials.



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6. The expressions $2x - 3$, $3x + 2y$, $xyz - 5$ etc. are all binomials. Note that $3x + 7x$ is not a binomial, because $3x + 7x = 10x$, which is a monomial.

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7. Are the expressions $a - b + 2x^2 + y^2 - xy$, $x^3 - 2y^3 - 3x^2y^2z$ etc. trinomials?

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8. True/False: In $-5xy$, the coefficient of x is $-5y$: the coefficient of y is $-5x$ and the coefficient of xy is -5 .

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9. In $-x$, the coefficient of x is -1 .

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10. In $3a^2bc$, the coefficient of a^2 is $3bc$, the coefficient of b is $3a^2c$ and the coefficient of c is $3a^2b$.

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11. In the algebraic expression $x^2 - xy + yz - 4$, the constant term is -4 .

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12. In the algebraic expression $2a^2b + 3ab^2 - 7ab - 4ba^2$, we have $2a^2b$ and $-4ba^2$ as like terms, whereas $3ab^2$ and $7ab$ are unlike

terms.

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13. Identify the terms, their coefficients for each of the following expressions:

(i) $7x^2yz - 5xy$ (ii) $x^2 + x + 1$

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14. Identify the terms, their coefficients for each of the following expressions: $3x^2y^2 - 5x^2y^2z^2 + z^2$ (ii) $9 - ab + bc - ca$

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15. Identify the terms, their coefficients for each of the following expressions: $\frac{a}{2} + \frac{b}{2} - ab$ (ii) $0.2x - 0.3xy + 0.5y$



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16. Classify the following polynomials as monomials, binomials, trinomials. Which polynomials do not fit in any category? (i) $x + y$
(ii) 1000 (iii) $x + x^2 + x^3 + x^4$



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17. Classify the following polynomials as monomials, binomials, trinomials. Which polynomials do not fit in any category?
 $7 + a + 5b$ (ii) $2b - 3b^2$ (iii) $2y - 3y^2 + 4y^3$



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18. Classify the following polynomials as monomials, binomials, trinomials. Which polynomials do not fit in any category?

$$5x - 4y + 3x \quad \text{(ii) } 4a - 15a^2 \quad xy + yz + zt + tx$$

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19. Classify the following polynomials as monomials, binomials, trinomials. Which polynomials do not fit in any category? pqr (ii)

$$p^2q + pq^2 \quad \text{(iii) } 2p + 2q$$

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20. Add ; $7x^2 - 4x + 5$, $-3x^2 + 2x - 1$ and $5x^2 - x + 9$.

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21. Add :

$$5x^2 - \frac{1}{3}x + \frac{5}{2}, \quad -\frac{1}{2}x^2 + \frac{1}{2}x - \frac{1}{3} \text{ and } -2x^2 + \frac{1}{5}x - \frac{1}{6}.$$

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22. Add the following algebraic expressions:

$$2, \frac{2y}{3} - \frac{5y^2}{3} + \frac{5y^3}{2}, -\frac{4}{3} + \frac{2y^2}{3} - \frac{y}{2}, \frac{5y^3}{3} + 3y^2 + 3y + \frac{6}{5}$$

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23. Subtract : $\left(-2y^2 + \frac{1}{2}y - 3\right)$ om $7y^2 - 2y + 10$.

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24. Subtract : $\frac{3}{2}x^2y + \frac{4}{5}y - \frac{1}{3}x^2yz$ from $\frac{12}{5}x^2yz - \frac{3}{5}xyz + \frac{2}{3}x^2y$.

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25. Take away $\frac{9}{2} + \frac{x}{2} + \frac{3}{5}x^2 + \frac{7}{4}x^3$ from $\frac{7}{2} - \frac{x}{3} - \frac{x^2}{5}$.



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26. Add the algebraic expressions: $3a^2b$, $-4a^2b$, $9a^2b$



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27. Add the algebraic expressions: $\frac{2}{3}a$, $\frac{3}{5}a$, $-\frac{6}{5}a$



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28. Add the algebraic expressions:

$4xy^2 - 7x^2y$, $12x^2y - 6xy^2$, $-3x^2y + 5xy^2$



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29. Add the algebraic expressions:

$$\frac{3}{2}a - \frac{5}{4}b + \frac{2}{5}c, \frac{2}{3}a - \frac{7}{2}b + \frac{7}{2}c, \frac{5}{3}a + \frac{5}{3}a + \frac{5}{2}b - \frac{5}{4}c$$

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30. Add the algebraic expressions:

$$\frac{11}{2}xy + \frac{12}{5}y + \frac{13}{7}x, -\frac{11}{2}y - \frac{12}{5}x - 13xy$$

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31. Add the algebraic expressions:

$$\frac{7}{2}x^3 - \frac{1}{2}x^2 + \frac{5}{3}, \frac{3}{2}x^3 + \frac{7}{4}x^2 - x + \frac{1}{3}, \frac{3}{2}x^2 - \frac{5}{2}x - 2$$

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32. Subtract: $-5xy$ from $12xy$



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33. Subtract: $2a^2$ from $-7a^2$



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34. Subtract: $2a - b$ from $3a - 5b$



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35. Subtract: $2x^3 - 4x^2 + 3x + 5$ from $4x^3 + x^2 + x + 6$



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36. Subtract: $\frac{3}{2}x - \frac{5}{4}y - \frac{7}{2}z$ from $\frac{2}{3}x + \frac{3}{2}y - \frac{4}{3}z$



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37. Subtract: $x^2y - \frac{4}{5}xy^2 + \frac{4}{3}xy$ from $\frac{2}{3}x^2y + \frac{3}{2}xy^2 - \frac{1}{3}xy$

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38. Subtract: $\frac{a-b}{7} - \frac{35}{3b} + \frac{6}{5ac}$ from $\frac{3}{5b} - \frac{4}{5a} + c$

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39. Take away : $\frac{6}{5}x^2 - \frac{4}{5}x^3 + \frac{5}{6} + \frac{3}{2}x$ from $\frac{x^3}{3} - \frac{5}{2}x^2 + \frac{3}{5}x + \frac{1}{4}$

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40. Take away : $\frac{5a^2}{2} + \frac{3a^3}{2} + \frac{a}{3} - \frac{6}{5}$ from $\frac{1}{3}a^3 - \frac{3}{4}a^2 - \frac{5}{2}$

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41. Take away: $\frac{7}{4}x^3 + \frac{3}{5}x^2 + \frac{1}{2}x + \frac{9}{2}$ from $\frac{7}{2} - \frac{x}{3} - \frac{x^2}{5}$

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42. Take away: $\frac{y^3}{3} + \frac{7}{3}y^2 + \frac{1}{2}y + \frac{1}{2}$ from $\frac{1}{3} - \frac{5}{3}y^2$

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43. Take away: $\frac{2}{3} + ac - \frac{5}{7}ab + \frac{2}{3}bc$ from $\frac{3}{2}ab - \frac{7}{4}ac - \frac{5}{6}bc$

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44. Subtract $3x - 4y - 7z$ from the sum of $x - 3y + 2z$ and $-4x + 9y - 11z$.



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45. Subtract the sum of $3l - 4m - 7n^2$ and $2l + 3m - 4n^2$ from the sum of $9l + 2m - 3n^2$ and $-3l + m + 4n^2$.



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46. Subtract the sum of $2x - x^2 + 5$ and $-4x - 3 + 7x^2$ from 5.



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47. Simplify: $x^2 - 3x + 5 - \frac{1}{2}(3x^2 - 5x + 7)$



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48. Simplify: $[5 - 3x + 2y - (2x - y)] - (3x - 7y + 9)$



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49. Simplify: $\frac{11}{2}x^2y - \frac{9}{4}xy^2 + \frac{1}{4}xy - \frac{1}{14}y^2x + \frac{1}{15}yx^2 + \frac{1}{2}xy$



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50.

Simplify:

$$\left(\frac{1}{3}y^2 - \frac{4}{7}y + 11\right) - \left(\frac{1}{7}y - 3 + 2y^2\right) - \left(\frac{2}{7}y - \frac{2}{3}y^2 + 2\right)$$



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51.

Simplify:

$$-\frac{1}{2}a^2b^2c + \frac{1}{3}ab^2c - \frac{1}{4}abc^2 - \frac{1}{5}cb^2a^2 + \frac{1}{6}cb^2a - \frac{1}{7}c^2ab + \frac{1}{8}ca^2b$$



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52. Find the product of the following pairs of polynomials: 4, $7x$ (ii)

$-4a$, $7a$ (iii) $4x$, $7xy$ (iv) $4x^3$, $-3xy$ (v) $4x$, 0



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53. Find the areas of rectangles with the following pairs of monomials as their length and breadth respectively: (x, y) (ii) $(10, 5y)$ (iii) $(2x^2, 5y^2)$ (iv) $(4a, 3a^2)$ (v) $(3mn, 4np)$



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54. Multiply: $3ab^2c^3$ by $5a^3b^2c$ (ii) $4x^2yz$ by $-\frac{3}{2}x^2yz^2$



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55. Multiply: $-\frac{8}{5}x^2yz^3$ by $-\frac{3}{4}xy^2z$ (ii) $\frac{3}{14}x^2y$ by $\frac{7}{2}x^4y$



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56. Find the volume of the rectangular boxes with following length, breadth and height respectively: (i) $2ax$, $3by$, $5cz$ (ii) m^2n , n^2p , p^2m

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57. Multiply: $-6a^2bc$, $2a^2b$ and $-\frac{1}{4}$ (ii) $\frac{4}{9}a^5b^2$, $10a^3b$ and 6

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58. Multiply: 3 , $15x$ and $-23x^2y$ (ii) x , x^2yz and $-\frac{3}{7}xyz^2$

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59. Find each of the following products:

$$(-2x^2) \times (7a^2x^7) \times (6a^5x^5) \quad \text{(ii)}$$

$$(4s^2t) \times (3s^3t^3) \times (2st^4) \times (-2)$$



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60. Multiply each of the monomial : $3xyz$, $5x$, 0



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61. Multiply each of the monomial : $\frac{6}{5}ab$, $\frac{5}{6}bc$, $\frac{12}{9}abc$



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62. Multiply each of the monomial :

$$\frac{3}{4}x^2yz^2, 0.5xy^2z^2, 1.16x^2yz^3, 2xyz$$



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63. Multiply each of the monomial : $20x^{10}y^{20}z^{30}$, $(10xyz)^2$



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64. Multiply each of the monomial :

$(-3x^2y)$, $(4xy^2z)$, $(-xy^2z^2)$ and $\left(\frac{4}{5}z\right)$



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65. Express the following product as a monomial :

$(x^3) \times (7x^5) \times \left(\frac{1}{5}x^2\right) \times (-6x^4)$



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66. Multiply $-\frac{4}{3}x^3$ by $\frac{6}{7}x^2y$ and verify your result for $x = 2$ and $y = 1$.

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67. Find the product of $-5x^2y$, $-\frac{2}{3}xy^2z$, $\frac{8}{15}xyz^2$ and $-\frac{1}{4}z$.
Verify the result when $x = 1$, $y = 2$ and $z = 3$.

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68. Find the value of $(5a^6) \times (-10ab^2) \times (-2.1a^2b^3)$ for $a = 1$ and $b = \frac{1}{2}$.

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69. Find each of the following products:

(a) $5x^2 \times 4x^3$

(b) $-3a^2 \times 4b^4$



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70. Find each of the following products: (i) $(-5xy) \times (-3x^2yz)$

(ii) $\frac{1}{2}xy \times \frac{2}{3}x^2yz^2$



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71. Find each of the following products:

$$\left(-\frac{7}{5}xy^2z\right) \times \left(\frac{13}{3}x^2yz^2\right) \left(-\frac{24}{25}x^3z\right) \times \left(-\frac{15}{16}xz^2y\right)$$



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72. Find each of the following products:

$$\left(-\frac{1}{27}a^2b^2\right) \times \left(\frac{9}{2}a^3b^2c^2\right) \quad (-7xy) \times \left(\frac{1}{4}x^2yz\right)$$

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73. Find each of the products: $(7ab) \times (-5ab^2c) \times (6abc^2)$

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74. Find each of the products: $(-5a) \times (-10a^2) \times (-2a^3)$

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75. Find each of the products: $(-4x^2) \times (-6xy^2) \times (-3yz^2)$

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76. Find each of the products:

$$\left(-\frac{2}{7}a^4\right) \times \left(-\frac{3}{4}a^2b\right) \times \left(-\frac{14}{5}b^2\right)$$

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77. Find each of the products:

$$\left(\frac{7}{9}ab^2\right) \times \left(\frac{15}{7}ac^2b\right) \times \left(-\frac{3}{5}a^2c\right)$$

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78. Find each of the products:

$$\left(\frac{4}{3}u^2vw\right) \times (-5uvw^2) \times \left(\frac{1}{3}v^2wu\right)$$

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79. Find each of the products: $(0.5x) \times \left(\frac{1}{3}xy^2z^4\right) \times (24x^2yz)$

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80. Find each of the products:

$$\left(\frac{4}{3}pq^2\right) \times \left(-\frac{1}{4}p^2r\right) \times (16p^2q^2r^2)$$

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81. Find each of the products: $(2.2xy) \times (0.1x) \times (0.16)$

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82. Express each of the products as a monomials and verify the

result in each case for $x = 1$: $(3x) \times (4x) \times (-5x)$

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83. Express each of the products as a monomials and verify the result in each case for $x = 1$: $(4x^2) \times (-3x) \times \left(\frac{4}{5}x^3\right)$

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84. Express each of the products as a monomials and verify the result in each case for $x = 1$: $(5x^4) \times (x^2)^3 \times (2x)^2$

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85. Express each of the products as a monomials and verify the result in each case for $x = 1$: $(x^2)^3 \times (2x) \times (-4x) \times (5)$

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86. Write down the product of $8x^2y^6$ and $-20xy$. Verify the product for $x = 2.5, y = 1$.

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87. Evaluate $(3.2x^6y^3) \times (2.1x^2y^2)$ when $x = 1$ and $y = 0.5$

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88. Find the value of $(5x^6) \times (-1.5x^2y^3) \times (-12xy^2)$ when $x = 1, y = 0.5$.

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89. Evaluate $(2.3a^5b^2) \times (1.2a^2b^2)$ when $a = 1$ and $b = 0.5$.

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90. Evaluate $(-8x^2y^6) \times (-20xy)f$ or $x = 2.5$ and $y = 1$.

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91. Express each of the products as a monomials and verify the result for $x = 1, y = 2$: $(xy^3) \times (yx^3) \times (xy)$

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92. find the product of following

$$\left(\frac{2}{5}a^2b\right) \times (-15b^2ac) \times \left(-\frac{1}{2}c^2\right)$$

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93. Express the product as a monomial

$$\left(-\frac{4}{7}a^2b\right) \times \left(-\frac{2}{3}b^2c\right) \times \left(-\frac{7}{6}c^2a\right)$$

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94. Express each of the products as a monomials

$$\left(\frac{4}{9}abc^3\right) \times \left(-\frac{27}{5}a^3b^2\right) \times (-8b^3c)$$

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95. Evaluate each of the that when $x = 2, y = -1$.

$$(2xy) \times \left(\frac{x^2y}{4}\right) \times (x^2) \times (y^2)$$

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96. Evaluate each of the that when $x = 2, y = -1$.

$$\left(\frac{3}{5}x^2y\right) \times \left(-\frac{15}{4}xy^2\right) \times \left(\frac{7}{9}x^2y^2\right)$$

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97. Multiply: $2x$ by $(3x + 5y)$

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98. Multiply: $(7xy + 5y)$ by $3xy$

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99. Multiply: $-\frac{3ab^2}{5}$ by $\left(\frac{2a}{3} - b\right)$

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100. Find the product of $\frac{7}{2}s^2t$ and $s + t$. Verify the result for $s = \frac{1}{2}$ and $t = 5$.

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101. Multiply: $\left(3x - \frac{4}{5}y^2x\right)$ by $\frac{1}{2}xy$.

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102. Find the following products: (a) $100x(0.01x^4 - 0.01x^2)$
(b) $121.5abx\left(ac + \frac{b}{10}\right)$

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103. Determine each of the products and find the value of each for

$$x = 2, y = 1.15, z = 0.01.$$

$$xz(x^2 + y^2)$$



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104. Determine the product of $z^2(x - y)$ and find the value if

$$x = 2, y = 1.15, z = 0.01.$$



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105. Determine the product and find the value for

$$x = 2, y = 1.15, z = 0.01. (2z - 3x) \times (-4y)$$



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106. Simplify the expressions and evaluate them as directed: (i)

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107. Add : $5m(3 - m)$ and $6m^2 - 13m$
 $4y(3y^2 + 5y - 7)$ and $2(y^3 - 4y^2 + 5)$

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108. Subtract $3pq(p - q)$ from $2pq(p + q)$

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109. Add: (i) $p(p - q)$, $q(q - r)$ and $r(r - p)$ (ii) $2x(z - x - y)$
and $2y(z - y - x)$

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110. Subtract: $3l(l - 4m + 5n)$ from $4l(10n - 3m + 2l)$

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111. Subtract: $3a(a + b + c) - 2b(a - b + c)$ from $4c(-a + b + c)$

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112. Simplify each of the expressions:
 $15a^2 - 6a(a - 2) + a(3 + 7a)$

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113. Simplify the following expression:

$$x^2(1 - 3y^2) + x(xy^2 - 2x) - 3y(y - 4x^2y)$$

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114. Simplify each of the following expressions:

$$4st(s - t) - 6s^2(t - t^2) - 3t^2(2s^2 - s) + 2st(s - t)$$

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115. Find the following products: $2a^3(3a + 5b)$ (ii) $-11a(3a + 2b)$

(iii) $-5a(7a - 2b)$

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116. Find the following products: $\frac{6x}{5}(x^3 + y^3)$ (ii) $xy(x^3 - y^3)$ (iii)

0. $1y(0.1x^5 + 0.1y)$



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117. Find the following products: (i) $\frac{4}{27}xyz \left(\frac{9}{2}x^2yz - \frac{3}{4}xyz^2 \right)$ (ii)

1. $5x(10x^2y - 100xy^2)$ (iii) 4. $1xy(1.1x - y)$



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118. Find the following products: (i) $\frac{7}{5}x^2y \left(\frac{3}{5}xy^2 + \frac{2}{5}x \right)$ (ii)

$\frac{4}{3}a(a^2 + b^2 - 3c^2)$



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119. Find the product $24x^2(1 - 2x)$ and evaluate its value for $x = 3$.



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120. Find the product $3y(xy + y^2)$ and find its value for $x = 4$ and $y = 5$.



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121. Multiply $-\frac{3}{2}x^2y^2$ by $(2x - y)$ and verify the answer for $x = 1$ and $y = 2$.



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122. Multiply the monomial by the binomial and find the value of each for $x = -1$, $y = 0.25$ and $z = 0.05$: (i) $15y^2(2 - 3x)$ (ii) $-3x(y^2 + z^2)$ (iii) $z^2(x - y)$



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123. Simplify: $2x^2(x^3 - x) - 3x(x^4 + 2x) - 2(x^4 - 3x^2)$

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

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125. Simplify: $3a^2 + 2(a + 2) - 3a(2a + 1)$

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126. Simplify: $x(x + 4) + 3x(2x^2 - 1) + 4x^2 + 4$

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127. Simplify: $a(b - c) - b(c - a) - c(a - b)$

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128. Simplify: $a(b - c) + b(c - a) + c(a - b)$

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129.

Simplify:

$$4ab(a - b) - 6a^2(b - b^2) - 3b^2(2a^2 - a) + 2ab(b - a)$$

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130. Simplify: $x^2(x^2 + 1) - x^3(x + 1) - x(x^3 - x)$

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131. Simplify: $2a^2 + 3a(1 - 2a^3) + a(a + 1)$

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132. Simplify: $a^2(2a - 1) + 3a + a^3 - 8$

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133. Simplify: $\frac{3}{2}x^2(x^2 - 1) + \frac{1}{4}x^2(x^2 + x) - \frac{3}{4}x(x^3 - 1)$

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134. Simplify: $a^2b(a - b^2) + ab^2(4ab - 2a^2) - a^3b(1 - 2b)$

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135.

Simplify:

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

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136. Multiply $(3x + 2y)$ and $(5x + 3y)$

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137. Multiply $(2x + 3y)$ and $(4x - 5y)$

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138. Multiply $\left(\frac{1}{5}x - \frac{1}{4}y\right)$ and $(5x^2 - 4y^2)$.

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139. Multiply $(7a + 3b)$ and $(2a + 3b)$ by column method.

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140. Multiply $(7x - 3y)$ by $(4x - 5y)$ by column method.

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141. Multiply $(3x^2 + y^2)$ by $(x^2 + 2y^2)$.

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142. Multiply $(0.5x - y)$ by $(0.5x + y)$

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143. Multiply $\left(4x + \frac{3y}{5}\right)$ and $\left(3x - \frac{4y}{5}\right)$

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144. Multiply: $\{2m + (-n)\}$ by $\{-3m + (-5)\}$

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145. Find the product of $\left(y + \frac{2}{7}y^2\right)$ and $(7y - y^2)$ and verify the result for $y = 3$.

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146. Find the value of the products:

$(x + 2y)(x - 2y)$ at $x = 1, y = 0$

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147. Find the value of the products:

$$(3m - 2n)(2m - 3n) \text{ at } m = 1, n = -1$$

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148. Find the value of the products:

$$(4a^2 + 3b)(4a^2 + 3b) \text{ at } a = 1, b = 2.$$

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149. Simplify: $\frac{1}{3}(6x^2 + 15y^2)(6x^2 - 15y^2)$

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150. Simplify: $9x^4(2x^3 - 5x^4) \times 5x^6(x^4 - 3x^2)$

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151. Simplify : $(2x + 5)(3x - 2) + (x + 2)(2x - 3)$

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152. Simplify: $(3x + 2)(2x + 3) - (4x - 3)(2x - 1)$

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153. Simplify: $(2x + 3y)(3x + 4y) - (7x + 3y)(x + 2y)$

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154. Multiply: $(2x^2 - 3x + 5)$ by $(5x + 2)$.

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155. Multiply: $(2x^2 - 4x + 5)$ by $(x^2 + 3x - 7)$

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156. Simplify: $(3x - 2)(x - 1)(3x + 5)$

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157. Simplify: $(5 - x)(3 - 2x)(4 - 3x)$

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158. Multiply: $(5x + 3)by(7x + 2)$ (ii) $(2x + 8)by(x - 3)$

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159. Multiply: $(7x + y)by(x + 5y)$ (ii) $(a - 1)by(0.1a^2 + 3)$

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160. Multiply: (i) $(3x^2 + y^2)by(2x^2 + 3y^2)$ (ii)
 $\left(\frac{3}{5}x + \frac{1}{2}y\right)by\left(\frac{5}{6}x + 4y\right)$

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161. Multiply: (i) $(x^6 - y^6)by(x^2 + y^2)$ (ii) $(x^2 + y^2)by(3a + 2b)$

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162. Multiply: $[-3d + (-7f)]by(5d + f)$



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163. Multiply: (i) $(2x^2y^2 - 5xy^2)by(x^2 - y^2)$ (ii)

$$\left(\frac{x}{7} + \frac{x^2}{2}\right)by\left(\frac{2}{5} + \frac{9x}{4}\right)$$



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164. Multiply: (i) $\left(\frac{a}{7} + \frac{a^2}{9}\right)by\left(\frac{b}{2} - \frac{b^2}{3}\right)$ (ii)

$$(3x^2y - 5xy^2)by\left(\frac{1}{5}x^2 + \frac{1}{3}y^2\right)$$



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165. Multiply: (i) $(2x^2 - 1)by(4x^3 + 5x^2)$ (ii)
 $(2xy + 3y^2)(3y^2 - 2)$



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166. Find the following product and verify the result for $x = -1, y = -2$: $(3x - 5y)(x + y)$



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



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168. Simplify: $(x^2 - 2y^2)(x + 4y)x^2y^2$



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169. Simplify: $a^2b^2(a + 2b)(3a + b)$



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



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171. Simplify: $(x^3 - 2x^2 + 5x - 7)(2x - 3)$



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172. Simplify: $(5x + 3)(x - 1)(3x - 2)$



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173. Simplify: $(5 - x)(6 - 5x)(2 - x)$

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174. Simplify: $(2x^2 + 3x - 5)(3x^2 - 5x + 4)$

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175. Simplify: $(3x - 2)(2x - 3) + (5x - 3)(x + 1)$

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176. Simplify: $(5x - 3)(x + 2) - (2x + 5)(4x - 3)$

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177. Simplify: $(3x + 2y)(4x + 3y) - (2x - y)(7x - 3y)$

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178. Simplify: $(x^2 - 3x + 2)(5x - 2) - (3x^2 + 4x - 5)(2x - 1)$

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179. Simplify:

$$(x^3 - 2x^2 + 3x - 4)(x - 1) - (2x - 3)(x^2 - x + 1)$$

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180. Evaluate: $(2x + 3y)^2$ (ii) $(2x - 3y)^2 (2x + 3y)2x - 3y$.

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181. Write down the squares of each of the following binomials:

$$\left(x + \frac{a}{2}\right) \text{ (ii) } \left(5b - \frac{1}{2}\right) \text{ (iii) } \left(y + \frac{y^2}{2}\right)$$



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182. Find the product of the binomials: $\left(\frac{4}{3}x^2 + 3\right)\left(\frac{4}{3}x^2 + 3\right)$



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183. Find the product of the following binomials:

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



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184. Find the product of the binomials: $(6x^2 - 7y^2)(6x^2 - 7y^2)$



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185. Find the product of the binomials: $\left(\frac{1}{2}x - \frac{1}{5}y\right) \left(\frac{1}{2}x - \frac{1}{5}y\right)$

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186. Find the product of the following binomials:

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

(ii) $\left(2a + \frac{3}{b}\right) \left(2a - \frac{3}{b}\right)$

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187. Find the product of the following binomials:

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

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188. If $x + \frac{1}{x} = 4$, find the values of $x^2 + \frac{1}{x^2}$

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189. If $x + \frac{1}{x} = 4$, find the values of $x^4 + \frac{1}{x^4}$

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

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191. If $x - \frac{1}{x} = 9$, find $x + \frac{1}{x}$.

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

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

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194. If $x + y = 12$ and $xy = 14$, find the value of $x^2 + y^2$.

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

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

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197. Find the continued product: $(x + 2)(x - 2)(x^2 + 4)$

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198. Find the continued product: $(2x + 3y)(2x - 3y)(4x^2 + 9y^2)$

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199. Find the continued product: $(x - 1)(x + 1)(x^2 + 1)(x^4 + 1)$

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200. Find the continued product:

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

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201. Find the continued product: $\left(x - \frac{y}{5} - 1\right) \left(x + \frac{y}{5} + 1\right)$

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202. Simplify the products: $(x^2 + x + 1)(x^2 - x + 1)$

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203. Simplify the product: $(x^2 + 2x + 2)(x^2 - 2x + 2)$

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204.

Prove

that:

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



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



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206. Using the formulae for squaring a binomial, evaluate the following : (101)² (ii) (99)² (iii) (93)²



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207. Simplify the following by using $(a + b)(a - b) = a^2 - b^2$. (i)

$$68 \times 72 \text{ (ii) } 101 \times 99 \text{ (iii) } 67 \times 73 \text{ (iv) } 128^2 - 77^2$$



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208. Find the value of x , if $6x = 23^2 - 17^2$



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209. Find the value of x , if $4x = 98^2 - 88^2$



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210. Find the value of x , if $25x = 536^2 - 136^2$



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211. What must be added to $9x^2 - 24x + 10$ to make it a whole square?



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212. Write the following squares of binomials as trinomials:

$$(x + 2)^2 \text{ (ii) } (8a + 3b)^2 \text{ (iii) } (2m + 1)^2 \text{ (iv) } \left(9a + \frac{1}{6}\right)^2$$



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213. Write the following squares of binomials as trinomials:

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



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214. Write the following squares of binomials as trinomials:

$$\left(\frac{3a}{2} - \frac{5b}{4}\right)^2 \text{ (ii) } (a^2b - bc^2)^2 \left(\frac{2a}{3b} + \frac{2b}{3a}\right)^2 \text{ (iv) } (x^2 - ay)^2$$



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215. Find the product of the following binomials;

(i) $(2x + y)(2x + y)$

(ii) $(a + 2b)(a - 2b)$



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216. Find the product of the following binomials;

(i) $(a^2 + bc)(a^2 - bc)$

(ii) $\left(\frac{4x}{5} - \frac{3y}{4}\right)\left(\frac{4x}{5} + \frac{3y}{4}\right)$



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217. Find the product of the following binomials;

(i) $\left(2x + \frac{3}{y}\right)\left(2x - \frac{3}{y}\right)$

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

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218. Find the product of the following binomials;

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

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

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219. Using the formula for squaring a binomial , evaluate the following: (102)² (ii) (99)² (iii) (1001)²

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220. Using the formula for squaring a binomial , evaluate the following: (999)² (ii) (703)²

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221. Simplify the following using the formula:

$$(a - b)(a + b) = a^2 - b^2:$$

(i) $(82)^2 - (18)^2$

(ii) $(467)^2 - (33)^2$

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222. Simplify the following using the formula:

$$(a - b)(a + b) = a^2 - b^2:$$

(i) $(79)^2 - (69)^2$

(ii) 197×203

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223. Simplify the following using the formula:

$$(a - b)(a + b) = a^2 - b^2: 113 \times 87 \text{ (ii) } 95 \times 105$$

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224. Simplify the following using the formula:

$$(a - b)(a + b) = a^2 - b^2: 1.8 \times 2.2 \text{ (ii) } 9.8 \times 10.2$$

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225. Simplify the following using the identities: $\frac{58^2 - 42^2}{16}$ (ii)

$$178 \times 178 - 22 \times 22$$

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226. Simplify the following using the identities:

$$\frac{198 \times 198 - 102 \times 102}{96} \quad \text{(ii) } 1.73 \times 1.73 - 0.27 \times 0.27$$

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227. Find the value of x , if: (i) $4x = (52)^2 - (48)^2$ (ii)

$$14x = (47)^2 - (33)^2 \quad \text{(iii) } 5x = (50)^2 - (40)^2$$

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

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229. If $x - \frac{1}{x} = 3$, find the values of $x^2 + \frac{1}{x^2}$ and $x^4 + \frac{1}{x^4}$.

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230. If $x^2 + \frac{1}{x^2} = 18$, find the values of $x + \frac{1}{x}$ and $x - \frac{1}{x}$.

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231. If $x + y = 4$ and $xy = 2$, find the values of $x^2 + y^2$

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232. If $x - y = 7$ and $xy = 9$, find the value of $x^2 + y^2$

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

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234. Find the values of the following expressions:

$$16x^2 + 24 + 9, \text{ when } x = \frac{7}{4}$$

$$64x^2 + 81y^2 + 144xy, \text{ when } x = 1 \text{ and } y = \frac{4}{3}$$

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235. If $x + \frac{1}{x} = 9$, find the value of $x^4 + \frac{1}{x^4}$.

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236. If $x + \frac{1}{x} = 12$, find the value of $x - \frac{1}{x}$.

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237. If $2x + 3y = 14$ and $2x - 3y = 2$, find the value of xy . [Hint use $(2x + 3y)^2 - (2x - 3y)^2 = 24xy$]



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238. If $x^2 + y^2 = 29$ and $xy = 2$, find the value of

(i) $x + y$

(ii) $x - y$



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239. What must be added to each of the following expressions to make it a whole squares? $4x^2 - 12x + 7$ (ii) $4x^2 - 20x + 20$



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240. Simplify: (i) $(x - y)(x + y)x^2 + y^2) (x^4 + y^4)$ (ii)

$(2x - 1)(2x + 1)(4x^2 + 1)(16x^4 + 1)$ (iii)

$(7m - 8n)^2 + (7m + 8n)^2$



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241. Simplify: $(m^2 - n^2m)^2 + 2m^3n^2$



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242. Show that : $(3x + 7)^2 - 84x = (3x - 7)^2$

$(9a - 5b)^2 + 180ab = (9a + 5b)^2$

$\left(\frac{4m}{3} - \frac{3n}{4}\right)^2 + 2mn = \frac{16m^2}{9} + \frac{9n^2}{16}$



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243. Show that : $(4pq + 3q)^2 - (4qp - 3q)^2 = 48pq^2$

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



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244. Find the following products:

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

(ii) $(x + 7)(x - 2)$

(iii) $(y - 4)(y - 3)$

(iv) $(y - 7)(y + 3)$

(vi) $(2x - 3)(2x + 5)$

(vii) $(3x + 4)(3x - 5)$



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245. Evaluate the following : 107 X 103 (ii) 56 X 48 (iii) 95 X 97

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246. Find the following products: (i) $(x + 4)(x + 7)$ (ii) $(x - 11)(x + 4)$ (iii) $(x + 7)(x - 5)$ (iv) $(x - 3)(x - 2)$

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247. Find the following products: (i) $(y^2 - 4)(y^2 - 3)$ (ii) $\left(x + \frac{4}{3}\right)\left(x + \frac{3}{4}\right)$ (iii) $(3x + 5)(3x + 11)$ (iv) $(2x^2 - 3)(2x^2 + 5)$

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248. Find the following products: (i) $(z^2 + 2)(z^2 - 3)$ (ii) $(3x - 4y)(2x - 4y)$ (iii) $(3x^2 - 4xy)(3x^2 - 3xy)$ (iv) $\left(x + \frac{1}{5}\right)(x + 5)$



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249. Find the following products: $\left(z + \frac{3}{4}\right)\left(z + \frac{4}{3}\right)$ (ii)

$$(x^2 + 4)(x^2 + 9) \quad (y^2 + 12)(y^2 + 6) \quad \text{(iv)} \quad (x^2 + 4)(x^2 + 9)$$

$$(p^2 + 16)\left(p^2 - \frac{1}{4}\right)$$



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250. Evaluate the following : 102×106 (ii) 109×107 (iii)

$$35 \times 37 \text{ (iv)} \quad 53 \times 55$$



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251. Evaluate the following : 104×96 (ii) 34×36 (iii)

$$994 \times 1006$$



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