



MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

FACTORISATION

Others

1. Write down all possible factors of $3x^2y$.



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2. Write down all possible factors of $12x^2$.



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3. Find the greatest common factors of the monomials $21a^3b^7$ and $35a^5b^5$



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4. Find the greatest common factors of the monomials $14x^2y^3$, $21x^2y^2$, $35x^4y^5z$.



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5. Find the greatest common factors of the monomials $6x^3a^2b^2c$, $8x^2ab^3c^3$



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6. Find the greatest common factor (GCF/HCF) of the following polynomials:

(i) $2x^2$ and $12x^2$

(ii) $6x^3y$ and $18x^2y^3$



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7. Find the greatest common factor (GCF/HCF) of the following polynomials:

(i) $7x$, $21x^2$ and $14xy^2$ (ii) $42x^2yz$ and

$63x^3y^2z^3$





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8. Find the greatest common factor (GCF/HCF) of the following polynomials: (i) $12ax^2$, $6a^2x^3$ and $2a^3x^5$

(ii) $9x^2$, $15x^2y^3$, $6xy^3$ and $21x^2y^2$



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9. Find the greatest common factor (GCF/HCF) of the following polynomials:

$4a^2b^3$, $-12a^3b$, $18a^4b^3$ (ii) $6x^2y^2$, $9xy^3$, $3x^3y^2$



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10. Find the greatest common factor (GCF/HCF) of the following polynomials:

$$a^2b^3, a^3b^2 \text{ (ii) } 36a^2b^2c^4, 54a^5c^2, 90a^4b^2c^2$$



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11. Find the greatest common factor (GCF/HCF) of the following polynomials:

$$(i) x^3 - yx^2$$

$$(ii) 15a^3 - 45a^2, -150a$$



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12. Find the greatest common factor (GCF/HCF) of the following polynomials:

$$(i) 2x^3y^2, 10x^2y^3, 14xy$$

$$(ii) 14x^3y^5, 10x^5y^3, 2x^2y^2$$



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13. Find the greatest common factor of the terms in each of the following expressions:

(i) $5a^4 + 10a^3 - 15a^2$

(ii) $2xyz + 3x^2y + 4y^2$

(iii) $3a^2b^2 + 4b^2c^2 + 12a^2b^2c^2$



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14. Factorize each of the following algebraic expressions:

(i) $3x + 15$

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

iii) $3x^2y - 6xy^2$

(iv) $6x^3 + 8x^2y$



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15. Factorize :

(i) $12x^3y^3 + 16x^2y^5 - 4x^5y^2$

(ii) $18a^3b^2 + 36ab^4 - 24a^2b^3$



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16. Factorize the following :

(1) $3x - 9$

(2) $5x - 15x^2$

(3) $20a^{12}b^2 - 15a^8b^4$

(4) $72x^6y^7 - 96x^7y^6$



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17. Factorize the following :

(i) $20x^3 - 40x^2 + 80x$

(ii) $2x^3y^2 - 4x^2y^3 + 8xy^4$

$$(iii) 10m^3n^2 + 15m^4n - 20m^2n^3$$

$$(iv) 2a^4b^4 - 3a^3b^5 - 6ab^3$$



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18. Factorize the following :

$$(i) 28a^2 + 14a^2b^2 - 21a^4$$

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

$$(iii) 2l^2mn - 3lm^2n + 4lmn^2$$

$$(iv) x^4y^2 - x^2y^4 - x^4y^4$$



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19. Factorize the following :

(1) $9x^2y + 3axy$

(2) $16m - 4m^2$

(3) $-4a^2 + 4ab - 4ca$

(4) $x^2yz + xy^2z + xyz^2$

(5) $ax^2y + bxy^2 + cxyz$



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20. Factorize :

(i) $7(2x + 5) + 3(2x + 5),$

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

$$(iii) 5a(2x + 3y) - 2b(2x + 3y),$$

$$(iv) 8(5x + 9y)^2 + 12(5x + 9y)$$



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21. Factorize: (a) $(y - x)a + (x - y)b$

(b) $9(a - 2b)^2 + 6(2b - a)$

(c) $(x - 2y)^2 - 4x + 8y$

(d) $2a + 6b - 3(a + 3b)^2$



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22. Factorize :

$$(i) (x + y)(2x + 3y) - (x + y)(x + 1)$$

$$(ii) (x + y)(2a + b) - (3x - 2y)(2a + b)$$



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23. Factorize each of the following algebraic expressions:

$$(i) 6x(2x - y) + 7y(2x - y)$$

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

$$(iii) 7a(2x - 3) + 3b(2x - 3)$$

$$(iv) 9a(6a - 5b) - 12a^2(6a - 5b)$$



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24. Factorize each of the following algebraic expressions:

$$(i) 5(x - 2y)^2 + 3(x - 2y)$$

$$(ii) 16(2l - 3m)^2 - 12(3m - 2l)$$

$$(iii) 3a(x - 2y) - b(x - 2y)$$

$$(iv) a^2(x + y) + b^2(x + y) + c^2(x + y)$$



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25. Factorize each of the following algebraic expressions: $x^4 - y^4$



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26. Factorize each of the following algebraic expressions:

(i) $x^3(a - 2b) + x^2(a - 2b)$

(ii) $2x - 3y)(a + b) + (3x - 2y)(a + b)$

(iii) $4(x + y)(3a - b) + 6(x + y)(2b - 3a)$



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27. Factorize:

(i) $x^2 + xy + 8x + 8y$ (ii)

$15xy - 6x + 10y - 4$



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28. Factorize:

(i) $15ab + 15 + 9b + 25a$

(ii) $n - 7 + 7lm - lmn$



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29. Factorize:

(i) $ax + bx + ay + by,$

(ii) $ax^2 + by^2 + bx^2 + ay^2,$

(iii) $a^2 + bc + ab + ac,$

(iv) $ax - ay + bx - by$



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30. Factorize: $a^2 + 2a + ab + 2b,$

$x^2 - xz + xy - xz$



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31. Factorize each of the following expressions:

(i) $a^2 - b + aba$ (ii) $xy - ab + bx - ay$



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32. Factorize each of the following

expressions: (i) $6ab - b^2 + 12ac - 2bc$,

(ii) $a(a + b - c) - bc$



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33. Factorize each of the following expressions:

(i) $a^2x^2 + (ax^2 + 1)x + a,$

(ii) $3ax - 6ay - 8by + 4bx$



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34. Factorize each of the following expressions:

(i) $a^3x + a^2(x - y) - a(y + z) - z,$

(ii)

$$(x^2 + 3x)^2 - 5(x^2 + 3x) - y(x^2 + 3x) + 5y$$



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35. Factorize:

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

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



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36. Factorize each of the following expressions:

(1) $qr - pr + qs - ps$

(2) $p^2q - pr^2 - pq + r^2$

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

(4) $ax + ay - bx - by$



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37. Factorize each of the following expressions:

$$(1) xa^2 + xb^2 - ya^2 - yb^2$$

$$(2) x^2 + xy + xz + yz$$

$$(3) 2ax + bx + 2ay + by$$

$$(4) ab - by - ay + y^2$$



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38. Factorize each of the following expressions:

$$(1) axy + bcxy - az - bcz$$

$$(2) lm^2 - mn^2 - lm + n^2$$

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

$$(4) 6xy + 6 - 9y - 4x$$



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39. Factorize each of the following expressions:

$$(1) x^2 - 2ax - 2ba + bx$$

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

$$(3) abx^2 + (ay - b)x - y$$

$$(4) (ac + by)^2 + (bx - ay)^2$$



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40. Factorize each of the following expressions:

$$(1) 16(a - b)^3 - 24(a - b)^2$$

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

$$(3) a^2x^2 + (ax^2 + 1)x + a$$

$$(4) a(a - 2b - c) + 2bc$$



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41. Factorize each of the following expressions:

$$(1) a(a + b - c) - bc$$

$$(2) x^2 - 11xy - x + 11y$$

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

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



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42. Factorize:

$$(i) 9a^2 - 16b^2$$

$$(ii) 36a^2 - (x - y)^2$$

$$(iii) 80a^2 - 45b^2$$

$$(iv) (3a - b)^2 - 9c^2$$



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43. Factorize: (i) $x^4 - y^4$

(ii) $16x^4 - 81$

(iii) $x^4 - (y + z)^4$

(iv) $2x - 32x^5$

(v) $3a^4 - 48b^4$

(vi) $81x^4 - 121x^2$



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44. Factorize:

$$(i) 16a^2 - \frac{25}{4a^2}$$

$$(ii) 16a^2b - \frac{b}{16a^2}$$

$$(iii) 100(x + y)^2 - 81(a + b)^2$$

$$(iv) (x - 1)^2 - (x - 2)^2$$



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45. Factorize each of the following algebraic expressions:

$$(i) x^4 - 81y^4$$

$$(ii) 2x^5 - 2x$$

$$(iii) 3x^4 - 243$$

$$(iv) 2 - 50x^2$$



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46. Factorize each of the following algebraic expressions:

$$(i) 16(2x - 1)^2 - 25z^2$$

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



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47. Factorize each of the following algebraic expressions:

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

(ii) $3 - 12(a - b)^2$



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48. Factorize each of the following algebraic expressions:

(i) $x(x + z) - y(y + z)$

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



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49. Factorize each of the following expressions:

(1) $16x^2 - 25y^2$

(2) $27x^2 - 12y^2$

(3) $144a^2 - 289b^2$

(4) $12m^2 - 27$



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50. Factorize each of the following expressions:

(i) $(2a - b)^2 - 16c^2$

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

(iii) $3a^5 - 48a^3$

(iv) $a^4 - 16b^4$



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51. Factorize each of the following expressions:

(1) $36l^2 - (m + n)^2$

$$(2) 25x^4y^4 - 1$$

$$(3) a^4 - \frac{1}{b^4}$$

$$(4) x^3 - 144x$$



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52. Factorize each of the following expressions:

$$(1) (3 + 2a)^2 - 25a^2$$

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

$$(3) \frac{1}{16}x^2 \frac{y^{24}}{49}y^2z^2$$

$$(4) 75a^3b^3 - 108ab^4$$



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53. Factorize each of the following expressions:

(1) $256x^5 - 81x$

(2) $a^4 - (2b + c)^4$

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

(4) $p^2q^2 - p^4q^4$



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54. Factorize each of the following expressions:

(1) $x^4 - 625$

(2) $x^4 - 1$

(3) $49(a - b)^2 - 25(a + b)^2$

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



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55. Factorize each of the following expressions:

$$(1)(2x + 1)^2 - 9x^4$$

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

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

$$(4) 16a^4 - b^4$$



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56. Factorize each of the following expressions:

$$(i) a^4b^4 - 81c^4$$

$$(ii) xy^9 - yx^9$$

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

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



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57. Factorize:

$$(i) x^2 + 8x + 16$$

$$(ii) 4a^2 - 4a + 1$$



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58. Factorize:

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

(ii) $x^4 - 10x^2y^2 + 25y^4$

(iii) $a^4 - 2a^2b^2 + b^4$



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59. Factorize: $4x^2 - 4xy + y^2 - 9z^2$ (ii)

$16 - x^2 - 2xy - y^2$



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60. Factorize:

(i) $(a^4 - 8a^2b^2 + 16b^4) - 256$

(ii) $a^4 - 6a^2b^2 + 9b^4 - 81$



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61. Factorize each of the following expressions:

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

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

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



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62. Factorize:

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

(ii)

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



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63. Factorize each of the following expressions:

(i) $9x^2 - 4y^2$

(ii) $36x^2 - 12x + 1 - 25y^2$





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64. Factorize each of the following expressions:

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

$$25x^2 - 10x + 1 - 36y^2$$



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65. Factorize:

(i) $x^2 + 8x + 15$

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



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66. Factorize:

(i) $9 - a^6 + 2a^3b^3 - b^6$

(ii) $x^{16} - y^{16} + x^8 + y^8$



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67. Factorize each of the following algebraic expressions:

(1) $4x^2 + 12xy + 9y^2$

$$(2) 9a^2 - 24ab + 16b^2$$

$$(3)p^2q^2 - 6pqr + 9r^2$$

$$(4) 36a^2 + 36a + 9$$



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68. Factorize each of the following algebraic expressions:

$$(1) 9a^4 - 24a^2b^2 + 16b^4 - 256$$

$$(2) 16 - a^6 + 4a^3b^3 - 4b^6$$

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

$$(4) x^2 + 2x + 1 - 9y^2$$



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69. Factorize each of the following algebraic expressions:

(1) $a^4 + 3a^2 + 4$

(2) $4x^4 + 1$

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

(4) $(x + 2)^2 - 6(x + 2) + 9$



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70. Factorize each of the following algebraic expressions:

$$49 - a^2 + 8ab - 16b^2$$

$$(2) a^2 - 8ab + 16b^2 - 25c^2$$

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



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71. Factorize each of the following algebraic expressions:

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

$$(2) 49 - x^2 - y^2 + 2xy$$

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

$$(4) x^2 - y^2 - 4xz + 4z^2$$



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72. Factorize each of the expressions:

$$x^2 + 6x + 8$$



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73. Factorize each of the following expressions:

$$x^2 + 4x - 21$$



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74. Factorize each of the following expressions:

$$x^2 - 7x + 12$$



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75. Factorize each of the quadratic polynomials:

$$x^2 - 23x + 132$$



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76. Factorize each of the quadratic polynomials:

$$x^2 - 21x + 108$$



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77. Factorize each of the quadratic polynomials:

$$x^2 + 5x - 36$$



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78. Factorize each of the following algebraic expressions:

(1) $x^2 + 12x - 45$

(2) $40 + 3x - x^2$

(3) $a^2 + 3a - 88$

(4) $a^2 - 14a - 51$



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79. Factorize each of the following algebraic expressions:

(1) $x^2 + 14x + 45$

(2) $x^2 - 22x + 120$

(3) $x^2 - 11x - 42$

(4) $a^2 + 2a - 3$



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80. Factorize each of the following algebraic expressions:

$$a^2 + 14a + 48$$

$$(2) x^2 - 4x - 21$$

$$(3) y^2 + 5y - 36$$

$$(4) (a^2 - 5a)^2 - 36$$



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81. Factorize:

$$(i) 2x^2 + 5x + 3$$

(ii) $6x^2 + 5x - 6$



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82. Factorize:

(i) $6x^2 - 13x + 6$

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



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83. Factorize: $12x^2 - 23xy + 10y^2$



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84. Factorize: $12x^2 + 7xy - 10y^2$



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85. Factorize: $6x^2 + 35xy - 6y^2$



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86. Factorize: $(2x + 3y)^2 - 5(2x + 3y) - 14$



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87. Resolve each of the following quadratic trinomials into factors:

(1) $2x^2 + 5x + 3$

(2) $2x^2 - 3x - 2$

(3) $3x^2 + 10x + 3$

(4) $7x - 6 - 2x^2$



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88. Resolve each of the following quadratic trinomials into factors:

(1) $7x^2 - 19x - 6$

(2) $28 - 31x - 5x^2$

(3) $3 + 23y - 8y^2$

(4) $11x^2 - 54x + 63$



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89. Resolve each of the following quadratic trinomials into factors:

$$(1) 7x - 6x^2 + 20$$

$$(2) 3x^2 + 22x + 35$$

$$(3) 12x^2 - 17xy + 6y^2$$



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90. Resolve each of the following quadratic trinomials into factors:

$$(1) 6x^2 - 13xy + 2y^2$$

$$(2) 14x^2 + 11xy - 15y^2$$

$$(3) 6a^2 + 17ab - 3b^2$$



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91. Resolve each of the following quadratic trinomials into factors:

(i) $15x^2 - 16xyz - 15y^2z^2$

(ii) $(x - 2y)^2 - 5(x - 2y) + 6$

(iii) $(2a - b)^2 + 2(2a - b) - 8$



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92. Factorize $y^2 + 6y + 8$ by using the method of completing the square.



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93. Factorise:

$$3m^2 + 24m + 36$$



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94. Factorize: $4y^2 - 8y + 3$



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95. Factorize: $6 - x - 2x^2$



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96. Factorize each of the following quadratic polynomials by using the method of completing the square:

(1) $p^2 + 6p + 8$

(2) $q^2 - 10q + 21$

(3) $p^2 + 6p - 16$



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97. Factorize each of the following quadratic polynomials by using the method of completing the square:

(1) $x^2 + 12x + 20$

(2) $a^2 - 14a - 51$



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98. Factorize each of the following quadratic polynomials by using the method of completing the square:

$$(1) y^2 - 7y + 12$$

$$(2) z^2 - 4z - 12$$



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