



MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

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: $2x^2$ 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: $7x$, $21x^2$ 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: $x^3, -yx^2$ (ii)

$$15a^3, -45a^2, -150a$$



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

$$2x^3y^2, 10x^2y^3, 14xy \quad \text{(ii)}$$

$$14x^3y^5, 10x^5y^3, 2x^2y^2$$



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

$$5a^4 + 10a^3 - 15a^2 \quad \text{(ii)} \quad 2xyz + 3x^2y + 4y^2$$

$$3a^2b^2 + 4b^2c^2 + 12a^2b^2c^2$$



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14. Factorize each of the following algebraic

expressions: $3x + 15$ (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)

$$28a^2 + 14a^2b^2 - 21a^4 \quad \text{(ii)} a^4b - 3a^2b^2 - 6ab^3$$

$$\text{(iii)} 2l^2mn - 3lm^2n + 4lmn^2 \quad \text{(iv)}$$

$$x^4y^2 - x^2y^4 - x^4y^4$$



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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 :

$$(1) 7(2x + 5) + 3(2x + 5),$$

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

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

$$(4)8(5x + 9y)^2 + 12(5x + 9y)$$



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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 :

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

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



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23. Factorize each of the following algebraic expressions:

$$(1) 6x(2x - y) + 7y(2x - y)$$

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

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

$$(4) 9a(6a - 5b) - 12a^2(6a - 5b)$$



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24. Factorize each of the following algebraic expressions:

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

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

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

$$(4) a^2(x + y) + b^2(x + y) + c^2(x + y)$$



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25. Factorize each of the following algebraic expressions:

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

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

$$(3)a(x - y) + 2b(y - x) + c(x - y)^2$$

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



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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: $x^2 + xy + 8x + 8y$ (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: $ax + bx + ay + by,$
 $ax^2 + by^2 + bx^2 + ay^2,$ $a^2 + bc + ab + ac,$
 $ax - ay + bx - by$



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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:

$$a^2 - b + ab - a \quad \text{(ii) } xy - ab + bx - ay$$



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32. Factorize each of the following

expressions:

$$6ab - b^2 + 12ac - 2bc,$$

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



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33. Factorize each of the following

expressions: $a^2x^2 + (ax^2 + 1)x + a,$

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



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34. Factorize each of the following

expressions: $a^3x + a^2(x - y) - a(y + z) - z$

,

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



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35. Factorize: 1) $x^3 - 2x^2y + 3xy^2 - 6y^3$ 2)

$$6ab - b^2 + 12ac - 2bc$$



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

$x^2 + xya + xz + yz$ (3) $2ax + bx + 2ay + by$

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



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38. Factorize each of the following

expressions: $axy + bcxy - az - bcz$



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39. Factorize each of the following expressions: $x^3 - 2x^2y + 3xy^2 - 6y^3$



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40. Factorize each of the following expressions: $16(a - b)^3 - 24(a - b)^2$



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41. Factorize each of the following expressions: $x^2 + y - xy - x$



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42. Factorize: $9a^2 - 16b^2$



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43. Factorize: $x^4 - y^4$



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44. Factorize: $16a^2 - \frac{25}{4a^2}$



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45. Factorize each of the following algebraic expressions: $2x^5 - 2x$



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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: $x^2 - 4x + 4y - y^2$



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48. Factorize each of the following algebraic expressions: $a^2 - b^2 - a - b$



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49. Factorize each of the following expressions: $16x^2 - 25y^2$ (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: (1) $(2a - b)^2 - 16c^2$ (2)

$(x + 2y)^2 - 4(2x - y)^2$ (3) $3a^5 - 48a^3$ (4)

$a^4 - 16b^4$



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51. Factorize each of the following expressions:

$36l^2 - (m + n)^2$ (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: $(3 + 2a)^2 - 25a^2$ (2)

$(x + y)^2 - (a - b)^2$ (3) $\frac{1}{16}x^2y^2 - \frac{4}{49}y^2z^2$



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53. Factorize each of the following

expressions: $256x^5 - 81x$ (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: $x^4 - 625$ (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: $(2x + 1)^2 - 9x^4$ (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: $a^4b^4 - 81c^4$ (2) $xy^9 - yx^9$ $x^3 - x$

(4) $18a^2x^2 - 32$



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57. Factorize: $x^2 + 8x + 16$ (ii) $4a^2 - 4a + 1$



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58. Factorize: $4x^2 + 12xy + 9y^2$ (ii)

$$x^4 - 10x^2y^2 + 25y^4 \quad a^4 - 2a^2b^2 + b^4$$



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

$$a^4 - 6a^2b^2 + 9b^4 - 81$$



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61. Factorize each of the following expressions:

$$x^2 - 2xy + y^2 - x + y \quad \text{(ii)}$$

$$4a^2 + 12ab + 9b^2 - 8a - 12b \quad \text{(iii)}$$

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



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62. Factorize: $4(x + y)^2 - 28y(x + y) + 49y^2$

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



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63. Factorize each of the following

expressions: $9x^2 - 4y^2$ (ii)

$36x^2 - 12x + 1 - 25y^2$



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64. Factorize each of the following

expressions: $x^2 + 2xy + y^2$



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65. Factorize: $x^2 + 8x + 15$ (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: $4x^2 + 12xy + 9y^2$ (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)

$$16 - a^6 + 4a^3b^3 - 4b^6 \quad (3) a^2 - 2ab + b^2 - c^2$$

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



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69. Factorize each of the following algebraic

expressions: $a^4 + 3a^2 + 4$ (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: $a^2 + 2ab + b^2 - c^2$ (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: $12x^2 + 7xy - 10y^2$



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

$$2x^2 - 3x - 2 \qquad 3x^2 + 10x + 3 \qquad (4)$$

$$7x - 6 - 2x^2$$



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88. Resolve quadratic trinomial into factors:

$$7x^2 - 19x - 6$$



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89. Resolve each of the following quadratic

trinomials into factors: $7x - 6x^2 + 20$ (2)

$$3x^2 + 22x + 35 \quad (3) \quad 12x^2 - 17xy + 6y^2$$



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90. Resolve each of the following quadratic trinomials into factors: $6x^2 - 13xy + 2y^2$ (2)

$$14x^2 + 11xy - 15y^2 \quad (3) \quad 6a^2 + 17ab - 3b^2$$



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

$$15x^2 - 16xyz - 15y^2z^2 \quad (\text{ii})$$

$$(x - 2y)^2 - 5(x - 2y) + 6 \quad (\text{iii})$$

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



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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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