

$$\begin{aligned}
 1. \quad & (x + 4)(x - 4) \\
 & x^2 - 4x + 4x - 16 \\
 & x^2 - 16
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & (x - 2)^2 \\
 & (x - 2)(x - 2) \\
 & x^2 - 2x - 2x + 4 \\
 & x^2 - 4x + 4
 \end{aligned}$$

$$\begin{aligned}
 5. \quad & (w + 12)^2 \\
 & (w + 12)(w + 12) \\
 & w^2 + 12w + 12w + 144 \\
 & w^2 + 24w + 144
 \end{aligned}$$

$$\begin{aligned}
 7. \quad & (c + 6)(c - 6) \\
 & c^2 - 6c + 6c - 36 \\
 & c^2 - 36
 \end{aligned}$$

$$\begin{aligned}
 9. \quad & (y - 15)^2 \\
 & (y - 15)(y - 15) \\
 & y^2 - 15y - 15y + 225 \\
 & y^2 - 30y + 225
 \end{aligned}$$

$$\begin{aligned}
 11. \quad & (a - 5)(a + 5) \\
 & a^2 + 5a - 5a - 25 \\
 & a^2 - 25
 \end{aligned}$$

$$\begin{aligned}
 13. \quad & (4r - 3x)^2 \\
 & (4r - 3x)(4r - 3x) \\
 & 16r^2 - 12rx - 12rx + 9x^2 \\
 & 16r^2 - 24rx + 9x^2
 \end{aligned}$$

$$\begin{aligned}
 15. \quad & (9 - 4x)^2 \\
 & (9 - 4x)(9 - 4x) \\
 & 81 - 36x - 36x + 16x^2 \\
 & 81 - 72x + 16x^2
 \end{aligned}$$

$$\begin{aligned}
 17. \quad & (6k + 8b)(6k - 8b) \\
 & 36k^2 - 48bk + 48bk - 64b^2 \\
 & 36k^2 - 64b^2
 \end{aligned}$$

$$\begin{aligned}
 19. \quad & (12x - 9r)(12x + 9r) \\
 & 144x^2 + 108rx - 108rx - 81r^2 \\
 & 144x^2 - 81r^2
 \end{aligned}$$

$$\begin{aligned}
 21. \quad & (7r - 1)^2 \\
 & (7r - 1)(7r - 1) \\
 & 49r^2 - 7r - 7r + 1 \\
 & 49r^2 - 14r + 1
 \end{aligned}$$

$$\begin{aligned}
 23. \quad & (3y - 2z)(3y + 2z) - (5y - 4z)^2 \\
 & 9y^2 + 6yz - 6yz - 4z^2 - (5y - 4z)^2 \\
 & 9y^2 - 4z^2 - (5y - 4z)(5y - 4z) \\
 & 9y^2 - 4z^2 - (25y^2 - 20yz - 20yz + 16z^2) \\
 & 9y^2 - 4z^2 - 25y^2 + 40yz - 16z^2 \\
 & -16y^2 - 4z^2 + 40yz - 16z^2 \\
 & -16y^2 - 4z^2 + 40yz - 16z^2 \\
 & -16y^2 + 40yz - 20z^2
 \end{aligned}$$

$$\begin{aligned}
 25. \quad & 6x - 2[3(x - 5) + (x + 4)(x - 4)] \\
 & 6x - 2[3x - 15 + (x + 4)(x - 4)] \\
 & 6x - 2[3x - 15 + x^2 - 4x + 4x - 16] \\
 & 6x - 2[3x - 15 + x^2 - 16] \\
 & 6x - 2[3x - 31 + x^2] \\
 & 6x - 6x + 62 - 2x^2 \\
 & -2x^2 + 62
 \end{aligned}$$

$$\begin{aligned}
 27. & (4x - 1)(4x - 1) - (2x + 1)(2x + 1) \\
 & 16x^2 - 4x - 4x + 1 - (2x + 1)(2x + 1) \\
 & 16x^2 - 8x + 1 - (2x + 1)(2x + 1) \\
 & 16x^2 - 8x + 1 - (4x^2 + 2x + 2x + 1) \\
 & 16x^2 - 8x + 1 - (4x^2 + 4x + 1) \\
 & 16x^2 - 8x + 1 - 4x^2 - 4x - 1 \\
 & 12x^2 - 8x + 1 - 4x - 1 \\
 & 12x^2 - 8x + 1 - 4x - 1 \\
 & 12x^2 - 12x + 1 - 1 \\
 & 12x^2 - 12x
 \end{aligned}$$

$$\begin{aligned}
 35. & (z - 15)^2 \\
 & (z - 15)(z - 15) \\
 & z^2 - 15z - 15z + 225 \\
 & z^2 - 30z + 225
 \end{aligned}$$

$$\begin{aligned}
 37. & (2x - 3y)[(x - 2)(x + 2) - (x - 2)^2] \\
 & (2x - 3y)[x^2 + 2x - 2x - 4 - (x - 2)^2] \\
 & (2x - 3y)[x^2 - 4 - (x - 2)(x - 2)] \\
 & (2x - 3y)[x^2 - 4 - (x^2 - 2x - 2x + 4)] \\
 & (2x - 3y)[x^2 - 4 - (x^2 - 4x + 4)] \\
 & (2x - 3y)[x^2 - 4 - x^2 + 4x - 4] \\
 & (2x - 3y)[-4 + 4x - 4] \\
 & (2x - 3y)[-8 + 4x] \\
 & -16x + 8x^2 + 24y - 12xy \\
 & 8x^2 - 12xy - 16x + 24y
 \end{aligned}$$

$$\begin{aligned}
 39. & 8(2z + y)(3z - 2y) - (z + y) \\
 & (16z + 8y)(3z - 2y) - (z + y) \\
 & 48z^2 - 32yz + 24yz - 16y^2 - (z + y) \\
 & 48z^2 - 8yz - 16y^2 - (z + y) \\
 & 48z^2 - 8yz - 16y^2 - z - y
 \end{aligned}$$

$$\begin{aligned}
 41. & (7b + 4c)(b - c) + (b - c)(b + 2c) \\
 & 7b^2 - 7bc + 4bc - 4c^2 + (b - c)(b + 2c) \\
 & 7b^2 - 3bc - 4c^2 + (b - c)(b + 2c) \\
 & 7b^2 - 3bc - 4c^2 + b^2 + 2bc - bc - 2c^2 \\
 & 7b^2 - 3bc - 4c^2 + b^2 + bc - 2c^2 \\
 & 8b^2 - 3bc - 4c^2 + bc - 2c^2 \\
 & 8b^2 - 2bc - 4c^2 - 2c^2 \\
 & 8b^2 - 2bc - 6c^2
 \end{aligned}$$

$$\begin{aligned}
 43. & (5r - 4d)(r + 3d) - (r - 6d)(2r - 4d) \\
 & 5r^2 + 15dr - 4dr - 12d^2 - (r - 6d)(2r - 4d) \\
 & 5r^2 + 11dr - 12d^2 - (r - 6d)(2r - 4d) \\
 & 5r^2 + 11dr - 12d^2 - (2r^2 - 4dr - 12dr + 24d^2) \\
 & 5r^2 + 11dr - 12d^2 - (2r^2 - 16dr + 24d^2) \\
 & 5r^2 + 11dr - 12d^2 - 2r^2 + 16dr - 24d^2 \\
 & 3r^2 + 11dr - 12d^2 + 16dr - 24d^2 \\
 & 3r^2 + 27dr - 12d^2 - 24d^2 \\
 & 3r^2 + 27dr - 36d^2
 \end{aligned}$$

$$\begin{aligned}
 45. & -6b(2b + 3)^2 \\
 & -6b(2b + 3)(2b + 3) \\
 & -6b(4b^2 + 6b + 6b + 9) \\
 & -6b(4b^2 + 12b + 9) \\
 & -24b^3 - 72b^2 - 54b
 \end{aligned}$$

$$\begin{aligned}
 47. & (2w + 3v)(w - 2v)(w + v) \\
 & (2w^2 - 4vw + 3vw - 6v^2)(w + v) \\
 & (2w^2 - vw - 6v^2)(w + v) \\
 & 2w^3 + 2w^2v - w^2v - wv^2 - 6wv^2 - 6v^3 \\
 & 2w^3 + w^2v - wv^2 - 6wv^2 - 6v^3 \\
 & 2w^3 + w^2v - wv^2 - 6wv^2 - 6v^3 \\
 & 2w^3 + w^2v - 7wv^2 - 6v^3
 \end{aligned}$$

49.

$$\begin{aligned}
 & (3x-2y)(5x+2y)-[(x-y)(x+y)+(x-y)^2] \\
 & 15x^2 + 6xy - 10xy - 4y^2 - [(x-y)(x+y)+(x-y)^2] \\
 & 15x^2 - 4xy - 4y^2 - [(x-y)(x+y)+(x-y)^2] \\
 & 15x^2 - 4xy - 4y^2 - [x^2 + xy - xy - y^2 + (x-y)^2] \\
 & 15x^2 - 4xy - 4y^2 - [x^2 - y^2 + (x-y)(x-y)] \\
 & 15x^2 - 4xy - 4y^2 - [x^2 - y^2 + x^2 - 2xy + y^2] \\
 & 15x^2 - 4xy - 4y^2 - [x^2 - y^2 + x^2 - 2xy + y^2] \\
 & 15x^2 - 4xy - 4y^2 - [2x^2 - y^2 - 2xy + y^2] \\
 & 15x^2 - 4xy - 4y^2 - [2x^2 - 2xy] \\
 & 15x^2 - 4xy - 4y^2 - 2x^2 + 2xy \\
 & 13x^2 - 4xy - 4y^2 + 2xy \\
 & 13x^2 - 2xy - 4y^2
 \end{aligned}$$

$$\begin{aligned}
 51. & -2z(2z-3)^2 + (z+3)(z-3) \\
 & -2z(2z-3)(2z-3) + (z+3)(z-3) \\
 & -2z(4z^2 - 6z - 6z + 9) + (z+3)(z-3) \\
 & -2z(4z^2 - 12z + 9) + (z+3)(z-3) \\
 & -8z^3 + 24z^2 - 18z + (z+3)(z-3) \\
 & -8z^3 + 24z^2 - 18z + z^2 - 3z + 3z - 9 \\
 & -8z^3 + 24z^2 - 18z + z^2 - 9 \\
 & -8z^3 + 25z^2 - 18z - 9
 \end{aligned}$$

$$\begin{aligned}
 53. & (2s-2y)(3s-3y) + (s-2y)(s+2y) \\
 & 6s^2 - 6sy - 6sy + 6y^2 + (s-2y)(s+2y) \\
 & 6s^2 - 12sy + 6y^2 + (s-2y)(s+2y) \\
 & 6s^2 - 12sy + 6y^2 + s^2 + 2sy - 2sy - 4y^2 \\
 & 6s^2 - 12sy + 6y^2 + s^2 - 4y^2 \\
 & 7s^2 - 12sy + 6y^2 - 4y^2 \\
 & 7s^2 - 12sy + 2y^2
 \end{aligned}$$

$$\begin{aligned}
 55. & (2w-8v)(3w+2v) + (w+2v)(6w-v) \\
 & 6w^2 + 4wv - 24wv - 16v^2 + (w+2v)(6w-v) \\
 & 6w^2 - 20wv - 16v^2 + (w+2v)(6w-v) \\
 & 6w^2 - 20wv - 16v^2 + 6w^2 - wv + 12wv - 2v^2 \\
 & 6w^2 - 20wv - 16v^2 + 6w^2 + 11wv - 2v^2 \\
 & 12w^2 - 20wv - 16v^2 + 11wv - 2v^2 \\
 & 12w^2 - 9wv - 16v^2 - 2v^2 \\
 & 12w^2 - 9wv - 18v^2
 \end{aligned}$$

$$\begin{aligned}
 57. & (3s+2t)[(s-t)(s+t)+(3s-t)(s+t)] \\
 & (3s+2t)[s^2 + st - st - t^2 + (3s-t)(s+t)] \\
 & (3s+2t)[s^2 - t^2 + 3s^2 + 3st - st - t^2] \\
 & (3s+2t)[s^2 - t^2 + 3s^2 + 2st - t^2] \\
 & (3s+2t)[4s^2 - t^2 + 2st - t^2] \\
 & (3s+2t)[4s^2 + 2st - 2t^2] \\
 & 12s^3 + 6s^2t - 6st^2 + 8st^2 + 4st^2 - 4t^3 \\
 & 12s^3 + 14s^2t - 6st^2 + 4st^2 - 4t^3 \\
 & 12s^3 + 14s^2t - 2st^2 - 4t^3
 \end{aligned}$$

$$\begin{aligned}
 59. & (y-z)(y+z) \\
 & y^2 - yz + yz - z^2 \\
 & y^2 - z^2
 \end{aligned}$$

$$\begin{aligned}
 61. & (-2+3z)(3-2z) \\
 & -6 + 4z + 9z - 6z^2 \\
 & -6 + 13z - 6z^2 \\
 & -6z^2 + 13z - 6
 \end{aligned}$$

$$\begin{aligned}
 63. & (4b + 7c)(2b - 4c) + (b + 3c)(b - c) \\
 & 8b^2 - 16bc + 14bc - 28c^2 + (b+3c)(b-c) \\
 & 8b^2 - 2bc - 28c^2 + (b + 3c)(b - c) \\
 & 8b^2 - 2bc - 28c^2 + b^2 - bc + 3bc - 3c^2 \\
 & 8b^2 - 2bc - 28c^2 + b^2 + 2bc - 3c^2 \\
 & 9b^2 - 28c^2 - 3c^2 \\
 & 9b^2 - 31c^2
 \end{aligned}$$

$$\begin{aligned}
 65. & (3 - 2y)^2 \\
 & (3 - 2y)(3 - 2y) \\
 & 9 - 6y - 6y + 4y^2 \\
 & 9 - 12y + 4y^2 \\
 & 4y^2 - 12y + 9
 \end{aligned}$$

$$\begin{aligned}
 67. & (4t - 4s)(3t + 2s) + [(s - 2)^2 + (t - 3)^2] \\
 & 12t^2 + 8st - 12st - 8s^2 + [(s-2)^2 + (t-3)^2] \\
 & 12t^2 - 4st - 8s^2 + [(s - 2)^2 + (t - 3)^2] \\
 & 12t^2 - 4st - 8s^2 + [(s - 2)(s - 2) + (t - 3)^2] \\
 & 12t^2 - 4st - 8s^2 + [s^2 - 2s - 2s + 4 + (t - 3)^2] \\
 & 12t^2 - 4st - 8s^2 + [s^2 - 4s + 4 + (t - 3)^2] \\
 & 12t^2 - 4st - 8s^2 + [s^2 - 4s + 4 + (t - 3)(t - 3)] \\
 & 12t^2 - 4st - 8s^2 + [s^2 - 4s + 4 + t^2 - 3t - 3t + 9] \\
 & 12t^2 - 4st - 8s^2 + [s^2 - 4s + 4 + t^2 - 6t + 9] \\
 & 12t^2 - 4st - 8s^2 + s^2 - 4s + t^2 - 6t + 13 \\
 & 13t^2 - 4st - 8s^2 + s^2 - 4s - 6t + 13 \\
 & 13t^2 - 4st - 7s^2 - 4s - 6t + 13
 \end{aligned}$$

$$\begin{aligned}
 69. & (9b - 3c)(2b + 4c) \\
 & 18b^2 + 36bc - 6bc - 12c^2 \\
 & 18b^2 + 30bc - 12c^2
 \end{aligned}$$