

## Factoring Practice

### TYPE 1: Greatest Common Factor:

1.  $6a^2 + 3a$
2.  $y^3 + 8y^2$
3.  $8x^2 - 4x^5$
4.  $5x^2y^3 + 15x^3y^2$
5.  $x(x-5) + 3(x-5)$
6.  $8xy + 10xz - 14xw$
7.  $10a^4 + 15a^2 - 25a$
8.  $12a^5b^2 + 18a^5b^4 - 24a^5b^3$
9.  $30xyz + 20xy - 40xz$
10.  $15x^3y^3z^3 - 12x^3y^2z^2 + 18x^2y^2z^3$

### TYPE 2: Grouping (4 terms)

11.  $ac + ad + bc + bd$
12.  $xy + xz + wy + wz$
13.  $b^3 - b^2 + 2b - 2$
14.  $y^3 - y^2 + 3y - 3$
15.  $y^3 - 8y^2 + y - 8$
16.  $t^3 + 6t^2 - 2t - 12$
17.  $10a^4 + 15a^2 - 25a - 30$
18.  $a^4 - a^3 + a^2 - a$
19.  $2y^4 + 6y^2 + 5y^2 + 15$
20.  $2xy + x^2y - 6 - 3x$

### TYPE 3a, 3b: Difference of Squares, Sum of Squares

21.  $4x^2 - 25$
22.  $4x^2 - 49$
23.  $9x^2 - 16y^2$
24.  $9x^2 + 16y^2$
25.  $25a^2 - 81$
26.  $100x^4 - 49y^2$
27.  $25x^2 + 81$
28.  $64x^4 - 9y^2$
29.  $16x^2 + 25$
30.  $81a^2 - 4b^2$

### TYPE 3c: Sum and Difference of Cubes

31.  $x^3 + 27$
32.  $x^3 - 27$
33.  $8a^3 - 125$
34.  $64x^3 + y^3$
35.  $x^6 - y^9$
36.  $r^6 + 27t^3$
37.  $27 + 125x^9$
38.  $27a^3 - 64b^3$
39.  $125 - x^3$
40.  $a^9 - 27$

**TYPE 4: Quadratic Trinomials of the form** $ax^2 + bx + c$  where  $a = 1$ : **double bubble**

41.  $x^2 + 13x + 36$

42.  $x^2 + 9x + 18$

43.  $t^2 - 8tw + 15w^2$

44.  $y^2 - 10y + 21$

45.  $t^2 - 2t - 15$

46.  $y^2 - 14y + 45$

47.  $x^2 + 5xy - 14y^2$

48.  $x^4 + 5x^2 + 6$

49.  $x^6 - 4x^3 - 32$

50.  $x^{10} - 10x^5 + 24$

**TYPE 4c: Perfect Square Trinomials** $ax^2 \pm bx + c$  where  $a$  and  $c$  are perfect squares

61.  $9y^2 - 30y + 25$

62.  $16x^2 + 72xy + 81y^2$

63.  $16y^2 + 56y + 49$

64.  $25x^2 - 60x + 36$

65.  $25y^2 - 80yz + 64z^2$

66.  $-25a^2 + 30a - 9$

67.  $49a^2 - 84ab + 36b^2$

68.  $64x^4 - 80x^2 + 25$

69.  $-9x^2 + 42x - 49$

70.  $100x^2 - 60xy + 9y^2$

**TYPE 4b: Quadratic Trinomials of the form** $ax^2 + bx + c$  where  $a \neq 1$ : **ac method**

51.  $3x^2 - 14x - 5$

52.  $3c^2 - 20c + 32$

53.  $12b^2 - 8b + 1$

54.  $3a^2 - a - 4$

55.  $6a^2 - 7ab - 10b^2$

56.  $6y^2 - y - 2$

57.  $3x^2 - 5xy - 2y^2$

58.  $4x^2 + 4x - 3$

59.  $4x^2 + 37x + 9$

60.  $3x^2 + 19xy + 20y^2$

**TYPE 5: Factor Completely**

71.  $10a^2x - 40x$

72.  $x^4 - y^4$

73.  $2x^2 - 20x + 50$

74.  $x^3 - 3x^2 - 18x$

75.  $2y^2 - 16y + 32$

76.  $10t^2 + 4t - 6$

77.  $18x^2 - 6x - 24$

78.  $6x^2 - 6y^2$

79.  $9x^3 - 25x$

80.  $2x^8 - 32$

1.  $3a(2a+1)$
2.  $y^2(y+8)$
3.  $4x^2(2-x^3)$
4.  $5x^2y^2(y+3x)$
5.  $(x-5)(x+3)$
6.  $2x(4y+5z-7w)$
7.  $5a(2a^3+3a-5)$
8.  $6a^5b^2(2+3b^2-4b)$
9.  $10x(3yz+2y-4z)$
10.  $3x^2y^2z^2(5xyz-4x+6z)$
11.  $(c+d)(a+b)$
12.  $(y+z)(x+w)$
13.  $(b-1)(b^2+2)$
14.  $(y-1)(y^2+3)$
15.  $(y-8)(y^2+1)$
16.  $(t+6)(t^2-2)$
17.  $5(2a^4+3a^2-5a-6)$
18.  $a(a-1)(a^2+1)$
19.  $(y^2+3)(2y^2+5)$
20.  $(2+x)(xy-3)$
21.  $(2x-5)(2x+5)$
22.  $(2x-7)(2x+7)$
23.  $(3x-4y)(3x+4y)$
24. Prime
25.  $(5a-9)(5a+9)$
26.  $(10x^2-7y)(10x^2+7y)$
27. Prime
28.  $(8x^2-3y)(8x^2+3y)$
29. Prime
30.  $(9a-2b)(9a+2b)$
31.  $(x+3)(x^2-3x+9)$
32.  $(x-3)(x^2+3x+9)$
33.  $(2a-5)(4a^2+10a+25)$
34.  $(4x+y)(16x^2-4xy+y^2)$
35.  $(x^2-y^3)(x^4+x^2y^3+y^6)$
36.  $(r^2+3t)(r^4-3r^2t+9t^2)$
37.  $(3+5x^3)(9-15x^3+25x^6)$
38.  $(3a-4b)(9a^2+12ab+16b^2)$
39.  $(5-x)(25+5x+x^2)$
40.  $(a^3-3)(a^6+3a^3+9)$
41.  $(x+9)(x+4)$
42.  $(x+6)(x+3)$
43.  $(t-5w)(t-3w)$
44.  $(y-7)(y-3)$
45.  $(t-5)(t+3)$
46.  $(y-9)(y-5)$
47.  $(x+7y)(x-2y)$
48.  $(x^2+2)(x^2+3)$
49.  $(x^3-8)(x^3+4)$
50.  $(x^5-6)(x^5-4)$
51.  $(3x+1)(x-5)$
52.  $(3c-8)(c-4)$
53.  $(6b-1)(2b-1)$
54.  $(3a-4)(a+1)$
55.  $(6a+5b)(a-2b)$
56.  $(3y-2)(2y+1)$
57.  $(3x+y)(x-2y)$
58.  $(2x-1)(2x+3)$
59.  $(4x+1)(x+9)$
60.  $(3x+4y)(x+5y)$
61.  $(3y-5)^2$
62.  $(4x+9y)^2$
63.  $(4y+7)^2$
64.  $(5x-6)^2$
65.  $(5y-8z)^2$
66.  $-1(5a-3)^2$
67.  $(7a-6b)^2$
68.  $(8x^2-5)^2$
69.  $-1(3x-7)^2$
70.  $(10x-3y)^2$
71.  $10x(a-2)(a+2)$
72.  $(x-y)(x+y)(x^2+y^2)$
73.  $2(x-5)^2$
74.  $x(x-6)(x+3)$
75.  $2(y-4)^2$
76.  $2(5t-3)(t+1)$
77.  $6(3x-4)(x+1)$
78.  $6(x-y)(x+y)$
79.  $x(3x-5)(3x+5)$
80.  $2(x^2-2)(x^2+2)(x^4+4)$