

Factoring Problems — Review

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Completely factor each of the following. Do not use a calculator. You should do all these problems as the problems are not in any specific order.

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| (1) $4xy + 8x^2$ | (2) $-2x^2yz - 4x^3y^4 - 6x^4y^2$ | (3) $x^2 + x - 2$ |
| (4) $(3x - 12)(2x + 8)$ | (5) $2x^2 + 7x - 49$ | (6) $x^2 - x - 6$ |
| (7) $2x^2 + 6x + 4$ | (8) $x^2 - a^2$ | (9) $-z^2 + 9$ |
| (10) $xy^2 - 4x$ | (11) $ax^2 + 7ax + 12a$ | (12) $2x^3 - 4x^2 - 30x$ |
| (13) $-y^2 - xy + 2x^2$ | (14) $x^2 + 4$ | (15) $(5x - 10)(4x^2 - 1)$ |
| (16) $3x^2 - 6x - 9$ | (17) $x^2 - 6x + 9$ | (18) $4x^2 - 9$ |
| (19) $4y^2 - 4xy + x^2$ | (20) $3ay^2 - 12axy + 12ax^2$ | (21) $9a^3b - 3a$ |
| (22) $a(x + 2) - b(x + 2)$ | (23) $4y^2 - 12y + 9$ | (24) $6x^3 - 10x^2 + 4x$ |
| (25) $2y^2 - xy - x^2$ | (26) $-2ay^2 + 2ax^2$ | (27) $6x^2 - 21x + 9$ |
| (28) $4a^2 - 4a - 3$ | (29) $x^2 - ax - 2a^2$ | (30) $x^2 + 4x + 4$ |
| (31) $-9x^3y^4 - 3x^2y^4 + 6x^4y^3$ | (32) $4x^3 - 4x^2 + x$ | (33) $6x^2 + 5x - 6$ |
| (34) $9x^2 - 6x + 1$ | (35) $-6xy^3 + 3x^2y^2 + 3x^3y$ | (36) $7x^2 - 23x + 6$ |
| (37) $4x^4 - 12x^2 + 9$ | (38) $x^2 - x - 6$ | (39) $2x^2y - 8y - 3x^2 + 12$ |
| (40) $x^2 - cx + 2x - 2c$ | (41) $-4x^2 - 24x - 20$ | (42) $36x^2y + 42xy - 30y$ |
| (43) $2bx + ax - 2b - a$ | (44) $8x^3 + 27$ | (45) $x^2 - (y + 2)^2$ |
| (46) $3x^4 - 10x^2 - 8$ | (47) $3x^5 - x^3 - 2x$ | (48) $2y^2 - 13y + 20$ |
| (49) $xy^4 - 2xy^2 + x$ | (50) $2x^4 - 9x^3 + 9x^2$ | (51) $-4b^2 + 3ab + a^2$ |
| (52) $-y^2 + x^2$ | (53) $x^4 - 1$ | (54) $4abx + 8bx - 12ax - 24x$ |
| (55) $(x + 1)^2 - y^2$ | (56) $x^3 - 27$ | (57) $x^2 - 8x + 16 - a^2$ |
| (58) $-3bc + 6ac + 5b - 10a$ | (59) $8x^3 - 1$ | (60) $x^4 - 81$ |
| (61) $3ax^2 - 21ax + 30a$ | (62) $7x^3 + 3x^2 + x$ | (63) $7x^2 - 44x + 12$ |
| (64) $x^6 - 3x^3 - 4$ | (65) $2x^2y^2 - 2xy^2$ | (66) $2y^2 - 2y - 12$ |
| (67) $12y^4 - 7x^2y^2 + x^4$ | (68) $3x^3 - 6x^2 - 15x$ | (69) $x^2 - x - 15$ |
| (70) $4x^2 + 4x - a^2 + 1$ | (71) $2x^2 - 2x - 4$ | (72) $2x^4 + x^2 - 1$ |
| (73) $x^2 - (y + 1)^2$ | (74) $2ax + 2x + 3a + 3$ | (75) $a^2x + 2ax + x$ |
| (76) $b^2 - y^2 - 2y - 1$ | (77) $-y^2 - 2y + x^2 + 4x + 3$ | (78) $a^2 - (y - 1)^2$ |
| (79) $2x^4 - 13x^2 + 20$ | (80) $54a^4 - 16a$ | (81) $2b^2 + 5ab + 2a^2$ |

Answers: (1) $4x(2x+y)$ (2) $-2x^2y(3x^2y+2xy^3+z)$ (3) $(x-1)(x+2)$ (4) $6(x-4)(x+4)$
 (5) $(2x-7)(x+7)$ (6) $(x-3)(x+2)$ (7) $2(x+1)(x+2)$ (8) $(x-a)(x+a)$
 (9) $(3-z)(3+z)$ (10) $x(y-2)(y+2)$ (11) $a(x+3)(x+4)$ (12) $2x(x-5)(x+3)$
 (13) $(x-y)(2x+y)$ (14) Does not factor (15) $5(x-2)(2x-1)(2x+1)$ (16) $3(x+1)(x-3)$
 (17) $(x-3)^2$ (18) $(2x-3)(2x+3)$ (19) $(x-2y)^2$ (20) $3a(2x-y)^2$
 (21) $3a(3a^2b-1)$ (22) $(x+2)(a-b)$ (23) $(2y-3)^2$ (24) $2x(3x-2)(x-1)$
 (25) $-(x-y)(x+2y)$ (26) $2a(x-y)(x+y)$ (27) $3(x-3)(2x-1)$ (28) $(2a+1)(2a-3)$
 (29) $(x-2a)(x+a)$ (30) $(x+2)^2$ (31) $3x^2y^3(2x^2-y-3xy)$ (32) $x(2x-1)^2$
 (33) $(3x-2)(2x+3)$ (34) $(3x-1)^2$ (35) $3xy(x-y)(x+2y)$ (36) $(7x-2)(x-3)$
 (37) $(2x^2-3)^2$ (38) $(x-3)(x+2)$ (39) $(2y-3)(x-2)(x+2)$ (40) $(x-c)(x+2)$
 (41) $-4(x+1)(x+5)$ (42) $6y(2x-1)(3x+5)$ (43) $(x-1)(a+2b)$ (44) $(2x+3)(4x^2-6x+9)$
 (45) $(x-y-2)(x+y+2)$ (46) $(x-2)(x+2)(3x^2+2)$ (47) $x(x-1)(x+1)(3x^2+2)$
 (48) $(y-4)(2y-5)$ (49) $x(y-1)^2(y+1)^2$ (50) $x^2(x-3)(2x-3)$ (51) $(a-b)(a+4b)$
 (52) $(x+y)(x-y)$ (53) $(x-1)(x+1)(x^2+1)$ (54) $4x(a+2)(b-3)$ (55) $(x+1-y)(x+1+y)$
 (56) $(x-3)(x^2+3x+9)$ (57) $(x-4-a)(x-4+a)$ (58) $(2a-b)(3c-5)$ (59) $(2x-1)(4x^2+2x+1)$
 (60) $(x-3)(x+3)(x^2+9)$ (61) $3a(x-2)(x-5)$ (62) $x(7x^2+3x+1)$ (63) $(7x-2)(x-6)$
 (64) $(x^3-4)(x+1)(x^2-x+1)$ (65) $2xy^2(x-1)$ (66) $2(y+2)(y-3)$ (67) $(x-2y)(x+2y)(x^2-3y^2)$
 (68) $3x(x^2-2x-5)$ (69) Does not factor (70) $(2x+1-a)(2x+1+a)$ (71) $2(x+1)(x-2)$
 (72) $(2x^2-1)(x^2+1)$ (73) $(x-y-1)(x+y+1)$ (74) $(2x+3)(a+1)$ (75) $x(a+1)^2$
 (76) $(b-y-1)(b+y+1)$ (77) $(x-y+1)(x+y+3)$ (78) $(a-y-1)(a-y+1)$
 (79) $(x-2)(x+2)(2x^2-5)$ (80) $2a(3a-2)(9a^2+6a+4)$ (81) $(a+2b)(2a+b)$