

## Worksheet #14 — Foil Factoring Problems

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Completely factor each of the following.

- |                             |                        |                         |
|-----------------------------|------------------------|-------------------------|
| (1) $x^2 + 3x + 2$          | (2) $y^2 - 5y + 6$     | (3) $2a^2 + a - 1$      |
| (4) $x^2 + 5x + 6$          | (5) $3x^2 - 3x - 36$   | (6) $q^2 - 4q - 5$      |
| (7) $6y^2 + y - 2$          | (8) $x^2 + 7x + 12$    | (9) $s^2 - 8s + 12$     |
| (10) $2x^2 + 7x + 3$        | (11) $x^2 + 2x - 8$    | (12) $a^2 + 4a - 45$    |
| (13) $4b^2 + 4b - 3$        | (14) $2x^2 - 4x + 2$   | (15) $t^2 + 4t - 12$    |
| (16) $a^2 - 3a - 18$        | (17) $x^2 + 4x - 21$   | (18) $y^2 - 5y + 6$     |
| (19) $a^2 + 2a + 1$         | (20) $5x^2 + 35x + 50$ | (21) $7z^2 + 20z - 3$   |
| (22) $12a^2 - 25a + 12$     | (23) $z^4 + 3z^2 + 2$  | (24) $-3a^2 - 24a - 21$ |
| (25) $x^2 - 7x + 10$        | (26) $x^2 - 20x + 99$  | (27) $x^2 - 4x + 4$     |
| (28) $2x^2 - 3x - 2$        | (29) $x^2 - 64$        | (30) $2y^2 - 7y - 4$    |
| (31) $36z^2 - 16$           | (32) $4b^2 - 4b + 1$   | (33) $20x^2 - 11x - 4$  |
| (34) $z^2 - 49$             | (35) $b^2 + 10b + 25$  | (36) $x^2 - 2x + 1$     |
| (37) $a^2 + 7a - 60$        | (38) $2x^2 + xy - y^2$ | (39) $6a^2 + ab - b^2$  |
| (40) $4x^2 - 4ax + a^2$     | (41) $12 + x - x^2$    | (42) $4x^2 - 22x + 10$  |
| (43) $a^2 - 8a + 16$        | (44) $28 + 7t - 21t^2$ | (45) $x^4 + 4x^2 + 3$   |
| (46) $4a^2 - b^2$           | (47) $x^4 - 8x^2 + 16$ | (48) $x^2 + 36$         |
| (49) $-x^2 - 5x - 6$        | (50) $9x^4 - y^2$      | (51) $a^6 + 5a^3 + 6$   |
| (52) $x^2 - x - 6$          | (53) $y^2 - 15y + 36$  | (54) $48 + 18x - 3x^2$  |
| (55) $z^2 + 8z + 16$        | (56) $z^2 - 20z + 36$  | (57) $t^2 - 12t - 13$   |
| (58) $x^2 + 15x - 100$      | (59) $3x^2 + 3x - 6$   | (60) $x^4 + 4x^2 + 3$   |
| (61) $y^4 + 4x^2y^2 + 4x^4$ | (62) $-x^2 - 3x - 2$   | (63) $x^2 - 2x - 3$     |
| (64) $4s^2 - 14s + 6$       | (65) $4x^2 - 16$       | (66) $4x^2 - 12x + 9$   |
| (67) $t^2 + 2t + 1$         | (68) $k^2 - 10k - 11$  | (69) $6x^2 - 5x + 1$    |
| (70) $t^2 - 9t - 36$        | (71) $15 - 7y - 2y^2$  | (72) $6x^2 - 24$        |
| (73) $25z^2 - 4$            | (74) $-b^2 + 9a^4$     | (75) $55a^2 - 19a - 20$ |
| (76) $-2x^2 - 7x + 15$      | (77) $25 - x^2$        | (78) $x^2 - 5x - 14$    |

- (79)  $x^2 - 4x + 4$  (80)  $2x^2 + 8x + 8$  (81)  $2x^2 - x - 10$   
(82)  $x^4 + x^2 - 2$  (83)  $t^4 - 6t^2 + 9$  (84)  $y^2 + 2xy + x^2$   
(85)  $2x^2 - 11x + 14$  (86)  $3t^2 - 23t - 8$  (87)  $z^2 - z - 20$   
(88)  $y^4 + 7y^2 + 6$  (89)  $t^2 - 19t - 20$  (90)  $21x^2 + 40x - 21$   
(91)  $24x^2 + 5x - 1$  (92)  $s^4 + 5s^2 + 6$  (93)  $25t^2 - 30t + 9$   
(94)  $a^2 - 9b^2$  (95)  $2s^2 + s - 6$  (96)  $2x^2 - 3x - 1$   
(97)  $24x^2 - 38x + 15$  (98)  $-y^2 - 4y - 3$  (99)  $-a^2 - 21a - 20$   
(100)  $12x^2 + 17x + 6$  (101)  $3b^2 + 5ab + 2a^2$  (102)  $-3x^2 + 7x + 6$   
(103)  $12z^2 - 25z + 12$  (104)  $2x^2 + 10x + 12$  (105)  $s^2 + s - 12$   
(106)  $y^2 + 7xy + 10x^2$  (107)  $48x^2 + 2x - 6$  (108)  $5y^2 - 17y + 6$   
(109)  $16z^2 - 25$  (110)  $14x^2 - 29x + 12$  (111)  $6x^2 - 5x - 12$   
(112)  $6x^2 + x - 12$  (113)  $a^2 - 25a + 100$  (114)  $3d^2 + 8d + 4$   
(115)  $-y^2 - y + 6$  (116)  $-6t^2 - 17t - 5$  (117)  $x^2 + 5x - 24$   
(118)  $-8y^2 - 18y - 9$  (119)  $-3t^2 - 7t + 6$  (120)  $x + 3\sqrt{x} + 2$

- Answers: (1)  $(x + 1)(x + 2)$  (2)  $(y - 3)(y - 2)$  (3)  $(2a - 1)(a + 1)$  (4)  $(x + 2)(x + 3)$
- (5)  $3(x - 4)(x + 3)$  (6)  $(q - 5)(q + 1)$  (7)  $(2y - 1)(3y + 2)$  (8)  $(x + 3)(x + 4)$
- (9)  $(s - 6)(s - 2)$  (10)  $(2x + 1)(x + 3)$  (11)  $(x - 2)(x + 4)$  (12)  $(a - 5)(a + 9)$
- (13)  $(2b - 1)(2b + 3)$  (14)  $2(x - 1)^2$  (15)  $(t + 6)(t - 2)$  (16)  $(a + 3)(a - 6)$
- (17)  $(x - 3)(x + 7)$  (18)  $(y - 3)(y - 2)$  (19)  $(a + 1)^2$  (20)  $5(x + 5)(x + 2)$
- (21)  $(7z - 1)(z + 3)$  (22)  $(3a - 4)(4a - 3)$  (23)  $(z^2 + 1)(z^2 + 2)$  (24)  $-3(a + 7)(a + 1)$
- (25)  $(x - 2)(x - 5)$  (26)  $(x - 9)(x - 11)$  (27)  $(x - 2)^2$  (28)  $(2x + 1)(x - 2)$
- (29)  $(x - 8)(x + 8)$  (30)  $(2y + 1)(y - 4)$  (31)  $4(3z + 2)(3z - 2)$  (32)  $(2b - 1)^2$
- (33)  $(5x - 4)(4x + 1)$  (34)  $(z - 7)(z + 7)$  (35)  $(b + 5)^2$  (36)  $(x - 1)^2$  (37)  $(a + 12)(a - 5)$
- (38)  $(x + y)(2x - y)$  (39)  $(3a - b)(2a + b)$  (40)  $(2x - a)^2$  (41)  $(4 - x)(3 + x) = -(x - 4)(x + 3)$
- (42)  $(2 - 4x)(5 - x)$  (43)  $(4 - a)^2$  (44)  $-7(3t - 4)(t + 1) = 7(4 - 3t)(1 + t)$  (45)  $(x^2 + 3)(x^2 + 1)$
- (46)  $(2a - b)(2a + b)$  (47)  $(x - 2)^2(x + 2)^2$  (48) Does Not Factor (49)  $-(x + 2)(x + 3)$
- (50)  $(3x^2 - y)(3x^2 + y)$  (51)  $(a^3 + 3)(a^3 + 2)$  (52)  $(x - 3)(x + 2)$  (53)  $(y - 12)(y - 3)$
- (54)  $-3(x - 8)(x + 2) = 3(8 - x)(2 + x)$  (55)  $(z + 4)^2$  (56)  $(z - 18)(z - 2)$  (57)  $(t - 13)(t + 1)$
- (58)  $(x - 5)(x + 20)$  (59)  $3(x - 1)(x + 2)$  (60)  $(x^2 + 1)(x^2 + 3)$  (61)  $(2x^2 + y^2)^2$
- (62)  $-(x + 2)(x + 1)$  (63)  $(x - 3)(x + 1)$  (64)  $(2 - 4s)(3 - s)$  (65)  $4(x + 2)(x - 2)$
- (66)  $(3 - 2x)^2$  (67)  $(t + 1)^2$  (68)  $(k - 11)(k + 1)$  (69)  $(3x - 1)(2x - 1)$  (70)  $(t - 12)(t + 3)$
- (71)  $(3 - 2y)(5 + y) = -(2y - 3)(y + 5)$  (72)  $(2x - 4)(3x + 6)$  (73)  $(5z - 2)(5z + 2)$
- (74)  $(3a^2 - b)(3a^2 + b)$  (75)  $(5a - 4)(11a + 5)$  (76)  $-(2x - 3)(x + 5) = (3 - 2x)(5 + x)$
- (77)  $(5 - x)(5 + x) = -(x - 5)(x + 5)$  (78)  $(x + 2)(x - 7)$  (79)  $(x - 2)^2$  (80)  $2(x + 2)^2$
- (81)  $(2x - 5)(x + 2)$  (82)  $(x - 1)(x + 1)(x^2 + 2)$  (83)  $(t^2 - 3)^2$  (84)  $(x + y)^2$  (85)  $(2x - 7)(x - 2)$

- (86)  $(t - 8)(3t + 1)$       (87)  $(z - 5)(z + 4)$       (88)  $(y^2 + 1)(y^2 + 6)$       (89)  $(t - 20)(t + 1)$
- (90)  $(7x - 3)(3x + 7)$       (91)  $(8x - 1)(3x + 1)$       (92)  $(s^2 + 2)(s^2 + 3)$       (93)  $(5t - 3)^2$
- (94)  $(a - 3b)(a + 3b)$       (95)  $(2s - 3)(s + 2)$       (96) Does Not Factor      (97)  $(6x - 5)(4x - 3)$
- (98)  $-(y + 1)(y + 3)$       (99)  $-(a + 20)(a + 1)$       (100)  $(4x + 3)(3x + 2)$       (101)  $(a + b)(2a + 3b)$
- (102)  $(3 - x)(2 + 3x)$       (103)  $(4z - 3)(3z - 4)$       (104)  $2(x + 2)(x + 3)$       (105)  $(s - 3)(s + 4)$
- (106)  $(5x + y)(2x + y)$       (107)  $(6x - 2)(8x + 3)$       (108)  $(5y - 2)(y - 3)$       (109)  $(4z - 5)(4z + 5)$
- (110)  $(7x - 4)(2x - 3)$       (111) Does Not Factor      (112)  $(3x - 4)(2x + 3)$       (113)  $(a - 20)(a - 5)$
- (114)  $(d + 2)(3d + 2)$       (115)  $-(y - 2)(y + 3) = (2 - y)(3 + y)$       (116)  $-(3t + 1)(2t + 5)$
- (117)  $(x + 8)(x - 3)$       (118)  $-(4y + 3)(2y + 3)$       (119)  $-(3t - 2)(t + 3) = (2 - 3t)(3 + t)$
- (120)  $(\sqrt{x} + 2)(\sqrt{x} + 1)$