

Section P.4

5. $10x^2y + 6xy - 14xy^2 = 2xy(5x + 3 - 7y)$
13. $6x^2 + 25x + 4 = (6x + 1)(x + 4)$
17. $6x^2 + xy - 40y^2 = (3x + 8y)(2x - 5y)$
22. $9x^4 + 10x^2 + 1 = (9x^2 + 1)(x^2 + 1)$
28. $b^2 - 4ac = (-4)^2 - 4(10)(-5) = 216$
The trinomial is not factorable over the integers.
32. $2x^2y^2 + xy - 1 = (2xy - 1)(xy + 1)$
46. $(x - 3)^2 - 16 = (x - 3 - 4)(x - 3 + 4) = (x - 7)(x + 1)$
54. $9x^4 - 30x^2y^2 + 25y^4 = (3x^2 - 5y^2)^2$
58. $64u^3 - 27v^3 = (4u - 3v)(16u^2 + 12uv + 9v^2)$
60. $1 + y^{12} = (1 + y^4)(1 - y^4 + y^8)$
62. $(y + 3)^3 + 8 = ((y + 3) + 2)((y + 3)^2 - 2(y + 3) + 4) = (y + 5)(y^2 + 6y + 9 - 2y - 6 + 4) = (y + 5)(y^2 + 4y + 7)$
68. $10z^3 - 15z^2 - 4z + 6 = 5z^2(2z - 3) - 2(2z - 3) = (2z - 3)(5z^2 - 2)$
76. $2x^6 - 2 = 2(x^6 - 1) = 2(x^3 - 1)(x^3 + 1) = 2(x - 1)(x^2 + x + 1)(x + 1)(x^2 - x + 1)$
82. $4y^2 - 4yz + z^2 - 9 = (2y - z)^2 - 9 = (2y - z - 3)(2y - z + 3)$
87. $4x^2 + 2x - y - y^2 = 4x^2 - y^2 + 2x - y = (2x - y)(2x + y) + (2x - y) = (2x - y)(2x + y + 1)$
92. $x^2 - 14xy + ky^2 = (x - \sqrt{k}y)^2 = x^2 - 2xy\sqrt{k} + ky^2 \Rightarrow -14xy = -2xy\sqrt{k} \Rightarrow 7 = \sqrt{k} \Rightarrow k = 49$
94. $x^{4n} - 2x^{2n} + 1 = (x^{2n} - 1)(x^{2n} - 1) = (x^n - 1)(x^n + 1)(x^n - 1)(x^n + 1) = (x^n - 1)^2(x^n + 1)^2$
98. $A = x^2 - y^2 = (x - y)(x + y)$