

Appendix B.4

2. A. $1-t^4 = (1-t^2)(1+t^2) = (1-t)(1+t)(1+t^2)$

B. $x^6 + x^5 + x^4 = x^4(x^2 + x + 1)$

C. $u^2v^2 - 225 = (uv-15)(uv+15)$

D. $81x^4 - x^2 = x^2(81x^2 - 1) = x^2(9x-1)(9x+1)$

4. A. $2x^2 - 7x - 4 = (2x+1)(x-4)$

B. $2x^2 + 7x - 4 = (2x-1)(x+4)$

C. $2x^2 + 7x + 4$ cannot be factored.

D. $-2x^2 - 7x + 4 = -(2x^2 + 7x - 4) = -(2x-1)(x+4)$

6. A. $x^4 - 2x^3 + 3x - 6 = x^3(x-2) + 3(x-2) = (x-2)(x^3+3)$

B. $a^2x + bx + a^2z + bz = x(a^2+b) + z(a^2+b) = (a^2+b)(x+z)$

7. A. $144 - x^2 = (12-x)(12+x)$

B. $144 + x^2$ cannot be factored

C. $144 - (y-3)^2 = [12 - (y-3)][12 + y - 3] = (15-y)(9+y)$

8. A. $4a^2b^2 + 9c^2$ cannot be factored

B. $4a^2b^2 - 9c^2 = (2ab-3c)(2ab+3c)$

C. $4a^2b^2 - 9(ab+c)^2 = [2ab - 3(ab+c)][2ab + 3(ab+c)]$
 $= (2ab - 3ab - 3c)(2ab + 3ab + 3c)$
 $= (-ab - 3c)(5ab + 3c) = -(ab + 3c)(5ab + 3c)$

12. A. $x^2 + 10x + 16 = (x+8)(x+2)$

B. $x^2 - 10x + 16$ cannot be factored.

16. A. $x^2 - 4x + 1$ cannot be factored

B. $x^2 - 4x - 3$ cannot be factored

$$23. A. ab - bc + a^2 - ac = b(a-c) + a(a-c) \\ = (a-c)(b+a)$$

$$B. (u+v)x - xy + (u+v)^2 - (u+v)y = x(u+v-y) + \\ (u+v)(u+v-y) = (u+v-y)(x+u+v)$$

$$24. A. 3(x+5)^3 + 2(x+5)^2 = (x+5)^2 (3(x+5) + 2) \\ = (x+5)^2 (3x+17)$$

$$B. a(x+5)^3 + b(x+5)^2 = (x+5)^2 (a(x+5) + b) = (x+5)^2 (ax+5a+b)$$

$$40. -1 + 6x - 12x^2 + 8x^3 \text{ cannot be factored}$$

$$62. (x^2+1)^{3/2} + (x^2+1)^{7/2} = (x^2+1)^{3/2} [1 + (x^2+1)^{4/2}] \\ = (x^2+1)^{3/2} (1 + (x^2+1)^2) = (x^2+1)^{3/2} (x^4 + 2x^2 + 2)$$

$$63. (x+1)^{-1/2} - (x+1)^{-3/2} = (x+1)^{-3/2} (x+1-1) = \frac{x}{(x+1)^{3/2}}$$

$$64. (x^2+1)^{-2/3} + (x^2+1)^{-5/3} = (x^2+1)^{-5/3} (x^2+1+1) = \frac{x^2}{(x^2+1)^{5/3}}$$

$$66. \frac{(ax+b)^{-1/2} - (ax+b)^{1/2}}{b} = \frac{(ax+b)^{-1/2} (1 - ax - b)}{b} = \frac{1 - ax - b}{b(ax+b)^{1/2}}$$

$$71. 2x(a^2+x^2)^{-1/2} - x^3(a^2+x^2)^{-3/2} = (a^2+x^2)^{-3/2} [2x(a^2+x^2) - x^3] \\ = \frac{2xa^2 + 2x^3 - x^3}{(a^2+x^2)^{3/2}} = \frac{2xa^2 + x^3}{(a^2+x^2)^{3/2}}$$

$$72. \frac{1}{2}(x-a)^{-1/2}(x+a)^{-1/2} - \frac{1}{2}(x+a)^{1/2}(x-a)^{-3/2} \\ = \frac{1}{2}(x-a)^{-3/2}(x+a)^{-1/2} [(x-a) - (x+a)] \\ = \frac{-2a}{2(x-a)^{3/2}(x+a)^{1/2}}$$