

IV. Quadratic Techniques

A. Trinomials $ax^n + bx^{\frac{n}{2}} + c$

(exponent of middle term is half the exponent on leading term)

15. $4x^4 - 17x^2 + 4$

$$\frac{\text{sum } -17 \quad \text{product } 16}{-1 \cdot -16}$$

$$\frac{-1}{4} \quad \frac{-16 \div 4}{4 \div 4} = \frac{-4}{1}$$

$$\left(\underset{(2x)^2}{4x^2} - 1 \right) \left(\underset{(x)^2}{x^2} - 4 \right)$$

$$\boxed{(2x-1)(2x+1)(x-2)(x+2)}$$

16. $2h^4 - 9h^2 + 4$

$$\frac{\text{sum } -9 \quad \text{product } 8}{-1 + -8 \quad -1 \cdot -8}$$

$$\frac{-1}{2} \quad \frac{-8 \div 2}{2 \div 2} = \frac{-4}{1}$$

$$\left(\underset{h^2}{2h^2} - 1 \right) \left(\underset{(h)^2}{h^2} - 4 \right)$$

$$\boxed{(2h^2-1)(h-2)(h+2)}$$

17. $n^4 + 6n^2 + 5$

$$\frac{\text{sum } 6 \quad \text{product } 5}{5 + 1 \quad 5 \cdot 1}$$

$$\frac{5}{1} \quad \frac{1}{1}$$

$$\boxed{(n^2+5)(n^2+1)}$$

18. $x^4 - 6x^2 - 27$

$$\frac{\text{sum } -6 \quad \text{product } -27}{-9 + 3 \quad -9 \cdot 3}$$

$$\frac{-9}{1} \quad \frac{3}{1}$$

$$\left(\underset{(x)^2}{x^2} - 9 \right) \left(x^2 + 3 \right)$$

$$\boxed{(x-3)(x+3)(x^2+3)}$$