

**FACTORIZING BY GROUPING**

$$1. (x^2 + 4x) + 3x + 12$$

$$\underline{x(x+4)} + \underline{3(x+4)}$$

$$(x+4)(x+3)$$

$$2. (x^2 - 8x) + 3x - 24$$

$$\underline{x(x-8)} + \underline{3(x-8)}$$

$$(x-8)(x+3)$$

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

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

$$(x-2)(3x^2+2)$$

$$4. (4x^5 - 8x^3) - 3x^2 + 6$$

$$\underline{4x^3(x^2-2)} - \underline{3(x^2-2)}$$

$$(x^2-2)(4x^3-3)$$

$$5. (c^2x^2 + x^2) - c^2 - 1$$

$$\underline{x^2(c^2+1)} - \underline{1(c^2+1)}$$

$$(c^2+1)(x^2-1) \text{ DOTS}$$

$$(c^2+1)(x-1)(x+1)$$

Challenge Section: Factoring with variable exponents.

$$1. y^{a+6} + 7y^a$$

$$\underline{y^a \cdot y^6} + \underline{7 \cdot y^a}$$

$$y^a(y^6 + 7)$$

$$2. x^{2a} + 3x^a - 18$$

$$(x^a + 6)(x^a - 3)$$

$$3. x^{b+2} - 16x^b$$

$$\underline{x^b \cdot x^2} - \underline{16 \cdot x^b}$$

$$x^b(x^2 - 16)$$

$$x^b(x-4)(x+4)$$

$$4. x^{6k} - 25$$

$$(x^{3k} - 5)(x^{3k} + 5)$$