

$$(1) 27a^3b^2 - 36a^2b$$

$$= 9a^2b(3b - 4a)$$

COMMON FACTOR

(1) largest common denominator
for coefficients

(2) smallest exponents.

$$(2) 49y^4 - 21y^2$$

$$= 7y^2(7y^2 - 3)$$

$$(3) 25x^4 + 20x^3 - 30x^2$$

$$= 5x^2(5x^2 + 4x - 6)$$

$$(4) 3x(y-2) + 7(y-2)$$

$$= (y-2)(3x+7)$$

$$\begin{aligned}
 (5) \quad & \underline{x^3 + 5x^2 + 6x + 30} \\
 & = (x^3 + 5x^2) + (6x + 30) \\
 & = x^2(x+5) + 6(x+5) \\
 & = (x+5)(x^2 + 6)
 \end{aligned}$$

FACTORIZING BY GROUPING.

$$\begin{aligned}
 (6) \quad & \underline{x^3 + 4x^2 - 7x - 28} \\
 & = (x^3 + 4x^2) + (-7x - 28) \\
 & = x^2(x+4) - 7(x+4) \\
 & = (x+4)(x^2 - 7)
 \end{aligned}$$

$$\begin{aligned}
 (7) \quad & \underline{12x^3 - 20x^2 + 9x - 15} \\
 & = (12x^3 - 20x^2) + (9x - 15) \\
 & = 4x^2(3x - 5) + 3(3x - 5) \\
 & = (3x - 5)(4x^2 + 3)
 \end{aligned}$$

$$\begin{aligned}
 & \underline{12x^3 - 20x^2 + 9x - 15} \\
 & = (12x^3 + 9x) + (-20x^2 - 15) \\
 & = 3x(4x^2 + 3) - 5(4x^2 + 3) \\
 & = (4x^2 + 3)(3x - 5)
 \end{aligned}$$

$$\begin{aligned}
 (8) \quad & \underline{6x^3 - 9x^2 - 16x + 24} \\
 & = (6x^3 - 9x^2) + (-16x + 24) \\
 & = 3x^2(2x - 3) + 8(-2x + 3) \\
 & = 3x^2(2x - 3) - 8(2x - 3) \\
 & = (2x - 3)(3x^2 - 8)
 \end{aligned}$$

III. Consider the difference of two squares.

A. $m^2 - 4$

$$= (m + 2)(m - 2)$$

B. $16x^2 - 9$

$$= (4x + 3)(4x - 3)$$

C. $4xy^2 - 4xz^2$

$$= x(4y^2 - 4z^2)$$

$$= x((2y)^2 - (2z)^2)$$

$$= x(2y + 2z)(2y - 2z)$$

$$= x[2(y+z)][2(y-z)] = x \cdot 2 \cdot 2(y+z)(y-z) = 4x(y+z)(y-z)$$

$$4xy^2 - 4xz^2$$

$$= 4x(y^2 - z^2)$$

$$= 4x(y+z)(y-z)$$

D. $16x^2 - 25z^2$

$$= (4x + 5z)(4x - 5z)$$

WEBASSIGN PRACTICE

$$\begin{aligned} \text{P.4-2} \quad & 7x^3 - 35x \\ & = 7x(x^2 - 5) \end{aligned}$$

$$\begin{aligned} \text{P.4-3} \quad & (3z^3 - 6z^2 + 9z) \\ & = 3z(z^2 - 2z + 3) \end{aligned}$$

$$\begin{aligned} \text{P.4-5} \quad & 32 - 162z^2 \\ & = 2(16 - 81z^2) \\ & = 2(4^2 - (9z)^2) \\ & = 2[(4 + 9z)(4 - 9z)] \end{aligned}$$