9.8 : Factor Polynomials by Grouping

PART 1:

Factor out a binomial:

a) $2x(x+4) - 3(x+4)$

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

b) $3y^2(y-2) - (y-2)$
$\qquad y-2 \qquad\qquad y-2$

$$(y-2)(3y^2-1)$$

PART 2:

Factor the polynomial:

a) $(x^3 + 3x^2) + (5x + 15)$

$x^2(x+3) + 5(x+3)$

$$(x+3)(x^2+5)$$

b) $(y^2 + y) + (yx + x)$
$\quad y \quad\quad y$

$y(y+1) + x(y+1)$

$$(y+1)(y+x)$$

c) $x^3 - 6 + 2x - 3x^2$

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

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

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

*NOTE: Factoring by grouping only works when you have an __EVEN!__ number of terms!

You try!

a) $x(x-2) + (x-2)$

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

b) $a^3 + 3a^2 + (a + 3)$

$a^2(a+3) + 1(a+3)$

$$(a+3)(a^2+1)$$

c) $2b^3 - 5b^2 - 3b$

$b(2b^2 - 5b - 3)$

$$b(2b+1)(b-3)$$