Worksheet 7.2: Factoring by Grouping

1. Multiply the following polynomials:

   (a) $(b+1)(a+2) =$

   (b) $(x^2 - 3)(x - 1) =$

2. Factoring By Grouping is the *inverse* (i.e. the mathematical opposite) of multiplying polynomials. For example, since

$$(x^2 + 2)(x - 1) = x^2(x - 1) + 2(x - 1) = x^3 - x^2 + 2x - 2$$

we can reverse the process:

$$x^3 - x^2 + 2x - 2 = x^2(x - 1) + 2(x - 1) = (x^2 + 2)(x - 1)$$

Factor each of the following by grouping. You may need to change the order of the terms. Be sure to check your answers by multiplying all the factors back together.

   $ab + b + 2a + 2 =$ Check:

   $x^3 - x^2 - 3x + 3 =$ Check:

$mx + qx + my + qy =$ Check:

$m^3 + 4m^2 - 6m - 24 =$ Check:

$6ax - by + 2bx - 3ay =$ Check:

$2rs + 4s - r - 2 =$ Check:

$x^2y + 6x - 3x^3 - 2y =$ Check:

$8 + 9y^4 - 6y^3 - 12y =$ Check:

$2x^3y^2 + x^2y^2 - 14xy^2 - 7y^2 =$ Check: