

Factoring Trinomials of the Form $ax^2 + bx + c$ Using the Grouping Method

Steps:	Example	Example	You try!	You try!
	$2x^2 + 7x + 3$	$20x^2 + 5x - 15$	$4x^2 - 16x + 15$	$9x^2 + 6x + 1$
First factor out any common factors if there are any.		$5(4x^2 + 1x - 3)$		
Find the factors of (a)(c) that add to b.	$a = 2, b = 7, c = 3$ $(a)(c) = 6x^2$ $\begin{array}{r} 6x^2 \\ \underline{1x \mid 6x} \end{array}$	$a = 4, b = 1, c = -3$ $(a)(c) = -12x^2$ $\begin{array}{r} -12x^2 \\ \underline{1x \mid 12x} \\ 2x \mid 6x \\ -3x \mid 4x \end{array}$		
Rewrite the expression with these factors in place of the bx term. Use parenthesis to reflect grouping and include a plus sign between the two groups. NOTE that you have not changed the problem.	$(2x^2 + 6x) + (x + 3)$	$5 [(4x^2 + 4x) + (-3x - 3)]$		
Factor out common factors of each group. If there are no common factors, factor out a one. The first term of the second expression should be positive, so factor out a -1 if necessary. If you have factored correctly, you will have a set of duplicate factors.	$2x(x + 3) + 1(x + 3)$	$5 [4x(x + 1) - 3(x + 1)]$		
Rewrite as the two factors.	$(2x + 1)(x + 3)$	$5[(4x - 3)(x + 1)]$		
Check your answer by multiplying the binomials!	$2x^2 + 6x + x + 3 =$ $2x^2 + 7x + 3$	$5(4x^2 + 4x - 3x - 3)$ $5(4x^2 + x - 3)$ $20x^2 + 5x - 15$		