This document illustrates two methods of factoring quadratic expressions. You may be familiar with the AC method. The SWING method is an alternative method that you may find easier to use.

Notice that Steps 1 through 3 are identical for both methods. Also note that you must put your quadratic expression in standard form before starting this process to insure you assign the correct values to a, b, and c.

AC				SWING						
Factor the expression $6x^2 - 11x - 7$										
STEP 1 Factor out the GCF if po	<b>STEP 1</b> Factor out the GCF if possible									
STEP 2 Multiply a and c				STEP 2 Multiply a and c						
a c	$a \times c$			а	С	$a \times c$				
6 -7	-42			6	-7	-42				
STEP 3 Write out the factors of	$a \times c$ . Fin	nd the	STEP 3 V	Vrite out t	he factors	of $a \times c$ . Fir	nd the			
two factors that add up to b.				two factors that add up to $b$ .						
Factors of	Factors of Sum of			Factors of		Sum of				
$a \times c$	Factors			$a \times c$		Factors				
1 -42	-41			1	-42	-41				
2 -21	-19			2	-21	-19				
3 -14	-11			3	-14	-11				
6 -7	-1			6	-7	-1				
<b>STEP 4</b> Rewrite the <i>bx</i> term as	STEP 4 Construct two factors as follows where									
factors identified in step 3.				$f_1$ and $f_2$ are the two factors identified in step 3.						
$ax^2 + f_1x + f_2x + c$				$(x + \frac{f_1}{a})(x + \frac{f_2}{a})$						
For our example the expression becomes				u u						
$6x^2 + 3x + -14x - 7$				Then simplify the fractions if possible.						
<b>STEP 5</b> Group the first two terms and the last two				For our example the interim factors are						
terms. Then divide out a common factor from				$(x+\frac{3}{6})(x-\frac{14}{6})$						
each group.	0 0									
$(6x^2 + 3x) + (-14x - 7)$				Simplified						
3x(2x+1) - 7(2x+1)				$(x+\frac{1}{2})(x-\frac{7}{3})$						
<b>STEP 6</b> Factor out the common	torm If +	here is no		Aultiply or	- ch factor h	w the simplif	iad			
common term, look for an error in a previous step.				<b>STEP 5</b> Multiply each factor by the simplified denominator to get rid of the fractions						
In our example $(2x + 1)$ is the common term.										
This leaves is with				$2\left(x+\frac{1}{2}\right)3(x-\frac{7}{3})$						
(2x+1)(3x-	This leaves us with									
	(2x+1)(3x-7)									

Another example.

AC				SWING					
		Fact	or the e	xpressi	on $3x^2$	-20x	+ 28		
STEP 1 Factor out the GCF if possibleSTEP 2 Multiply a and c				STEP 1 Factor out the GCF if possibleSTEP 2 Multiply a and c					
	3	28	84			3	28	84	
<b>STEP 3</b> Write out the factors of $a \times c$ . Find the two factors that add up to $b$ .				<b>STEP 3</b> Write out the factors of $a \times c$ . Find the two factors that add up to <i>b</i> .					
Г	Factors of		Sum of	7		Factors of		Sum of	]
	a × c		Factors			$a \times c$		Factors	
F	-1	-84	-85	1		-1	-84	-85	1
F	-2	-42	-44	1		-2	-42	-44	1
F	-3	-28	-31	7		-3	-28	-31	1
	-4	-21	-25			-4	-21	-25	
	-6	-14	-20			-6	-14	-20	
<b>STEP 4</b> Rewrite the <i>bx</i> term as the sum of the two factors identified in step 3. $ax^2 + f_1x + f_2x + c$ For our example the expression becomes $3x^2 + -6x + -14x + 28$ <b>STEP 5</b> Group the first two terms and the last two terms. Then divide out a common factor from each group. $(3x^2 - 6x) + (-14x + 28)$ 3x(2x - 2) - 14(2x - 2)				STEP 4 Construct two factors as follows where $f_1$ and $f_2$ are the two factors identified in step 3. $(x + \frac{f_1}{a})(x + \frac{f_2}{a})$ Then simplify the fractions if possible. For our example the interim factors are $(x + \frac{-6}{3})(x + \frac{-14}{3})$ Simplified $(x - 2)(x - \frac{14}{3})$					
<b>STEP 6</b> Factor out the common term. If there is no common term, look for an error in a previous step. In our example $(2x - 2)$ is the common term. This leaves is with (2x - 2)(3x - 14)				STEP 5 Multiply each factor by the simplified denominator to get rid of the fractions $(x-2) \ 3(x-\frac{14}{3})$ This leaves us with (x-2)(3x-14)					