Hirsch

Review: Factor the following:

1. $f(x) = x^2 + 3x - 18$ $\quad -18 = -3 \cdot 6$

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

2. $f(x) = x^2 + 8x + 12$ $\quad 12 = 2 \cdot 6$

$(x+2)(x+6)$

Factoring when a ≠ 1

Steps:
1. **Factor out common values**
2. **Find the factors of (a)(c)**
3. **Determine which of the factors add together to give you b.**
4. **Set up your parentheses with appropriate factors.**

Signs:

If 2nd sign is negative (-)

You will have (+)(-) or
You will have (-)(+)

If 2nd sign is positive (+)

You will have (+)(+) if 1st sign is +
You will have (-)(-) if 1st sign is -

grouping method

box method

Factoring when a ≠ 1

Ex. 1 $2x^2 - 11x - 6$

$a \cdot c = -12 \quad -12 \cdot 1$

$\frac{2x^2}{2x} - \frac{12x}{2x} + \frac{1x}{1} - \frac{6}{1}$

$2x(x-6) + 1(x-6)$

$(2x+1)(x-6)$

Ex. 2 $2x^2 + 13x + 6$

$a \cdot c = 12 \quad 1 \cdot 12$

	x	6
2x	$2x^2$	12x
1	1x	6

$(2x+1)(x+6)$

Factoring when a ≠ 1

Ex. 3 $4x^2 + 3x - 1$

$a \cdot c = -4 \quad 4 \cdot -1$

$\frac{4x^2}{4x} + \frac{4x}{4x} - \frac{1x}{-1} - \frac{1}{-1}$

$4x(x+1) - 1(x+1)$

$(4x-1)(x+1)$

Ex. 4 $3x^2 + 2x - 8$

$a \cdot c = -24 \quad 6 \cdot -4$

	x	2
3x	$3x^2$	6x
-4	-4x	-8

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

Factoring when a ≠ 1

You Try:

5. $2x^2 + 7x + 3$

$a \cdot c = 6 \quad 1 \cdot 6$

$\frac{2x^2}{x} + \frac{1x}{x} + \frac{6x}{3} + \frac{3}{3}$

$x(2x+1) + 3(2x+1)$

$(2x+1)(x+3)$

6. $3x^2 + 17x + 10$

$a \cdot c = 30 \quad 15 \cdot 2$

	x	5
3x	$3x^2$	15x
2	2x	10

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

Factoring when a ≠ 1

You Try:

7. $5x^2 - 7x + 2$

$a \cdot c = 10 \quad -2 \cdot -5$

$\frac{5x^2}{x} - \frac{2x}{x} - \frac{5x}{-1} + \frac{2}{-1}$

$x(5x-2) - 1(5x-2)$

$(5x-2)(x-1)$

8. $7x^2 - 4x - 3$

$a \cdot c = -21 \quad -7 \cdot 3$

	x	-1
7x	$7x^2$	-7x
3	3x	-3

$(7x+3)(x-1)$