

## Factoring Trinomials; $ax^2 + bx + c, a \neq 1$

## ac Method\*

### Procedure:

1. Multiply  $a$  by  $c$
  2. Find factors of  $ac$  whose sum is  $b$
  3. Rewrite the trinomial by separating the linear term into a sum by using the factors of  $ac$  whose sum is  $b$
  4. Separate the terms of the new polynomial and factor using the Grouping Method
- The  $ac$  Method works for binomials and trinomials for integer values of  $a$  – including  $a = 1$ .

Example: Factor  $8x^2 + 14x + 3$

1.  $ac = 8 \times 3 \rightarrow 24$
2. factors of 24; (24, 1), (12, 2), (8, 3), (6, 4)
3. factors whose sum is 14 are 12 and 2, rewriting trinomial,  $8x^2 + 2x + 12x + 3$
4. Group 1<sup>st</sup> two terms and the last two terms and factor using the Distributive Property

$$2x(4x + 1) + 3(4x + 1) = (4x + 1)(2x + 3)$$

1.  $3x^2 + 20x + 25$

2.  $4x^2 - 25$

3.  $x^2 + 7x + 12$

4.  $15x^2 + 11x + 2$

5.  $2x^2 - x - 3$

6.  $6x^2 + 5x - 6$

