

A-C Factoring Method

$$5x^2 + 19x + 12 = 0$$

$$A \cdot C = 60$$

$$B = 19$$

$$\begin{array}{r} 60 \\ \times \\ 19 \\ \hline \end{array}$$

\downarrow \downarrow \downarrow
A B C

We need 2 numbers that multiply to 60 and add to 19. It's 15, 4

Split the middle term, $19x$ into $15x$ and $4x$

$$5x^2 + 15x + 4x + 12 \quad \text{next, group as follows}$$

$$(5x^2 + 15x) + (4x + 12)$$

$$\begin{array}{ccc} \downarrow & & \downarrow \\ \text{GCF} = 5x & & \text{GCF} = 4 \end{array}$$

$$5x(x+3) + 4(x+3) \quad \text{now factor out } (x+3)$$

$$(x+3)(5x+4) \quad \text{Done!}$$

$$12x^2 - x - 6$$

We split the $-1x$
into $-9x + 8x$

$$AC = -72$$

$$B = -1$$

$$\begin{array}{r} -72 \\ \times \\ x \\ + \\ -1 \end{array}$$

2 numbers add to -1 and
multiply to -72 $-9, 8$
split middle term.

$$(12x^2 - 9x) + (8x - 6)$$

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

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

$$7x^2 + 20x - 3$$

$$AC = -21$$

$$B = 20$$

$$\begin{array}{r} -21 \\ \times \\ x \\ + \\ 20 \end{array}$$

$$(7x^2 + 21x) + (-1x - 3)$$

$$(7x^2 + 21x) - 1(x + 3)$$

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

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