

$x^2 + 8x + 15$ → both signs are the same
 $(x+3)(x+5)$ → both positive

$x^2 + 2x - 8$ → signs are different
 $(x+4)(x-2)$ → largest # is negative

$x^2 - 8x + 12$ → signs are the same
 $(x-6)(x-2)$ → both are negative
 To check:
 $x^2 - 2x - 6x + 12$
 $x^2 - 8x + 12$

$x^2 + 5x - 6$ → signs are different
 $(x+6)(x-1)$ → largest # is neg.

$x^2 - 5x - 6$ $(x+3)(x-2)$

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$3x^2 - 17x + 10$

~~$\begin{matrix} & 30 & \\ -2 & & -15 \\ & -17 & \end{matrix}$~~

$\begin{matrix} & 30 & \\ 2 & & 15 \\ & -10 & \\ & 5 & -6 & \end{matrix}$

$(3x-2)(x-5)$

$\begin{matrix} & x & -5 \\ 3x & 3x^2 & -15x \\ -2 & -2x & 10 \end{matrix}$

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$4x^2 - 4x - 3$

~~$\begin{matrix} & -12 & \\ 2 & & -6 \\ & -4 & \end{matrix}$~~

$\begin{matrix} & 12 & \\ 2 & & 6 \\ & 3 & 4 \end{matrix}$

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

Check
 $4x^2 + 2x - 6x - 3$
 $4x^2 - 4x - 3$

$\begin{matrix} & 2x & -3 \\ 2x & 4x^2 & -6x \\ 1 & 2x & -3 \end{matrix}$

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$14x^2 + 2x - 12$

$2(7x^2 + x - 6)$

~~$\begin{matrix} & -42 & \\ -6 & & 7 \\ & 1 & \end{matrix}$~~

$\begin{matrix} & 42 & \\ 1 & & 42 \\ 2 & & 21 \\ 3 & & 14 \\ 6 & & 7 \end{matrix}$

$2(7x-6)(x+1)$

$\begin{matrix} & x & 1 \\ 7x & 7x^2 & 7x \\ -6 & -6x & -6 \end{matrix}$

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 #30-40 even
 46, 61, 62, 64

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