

Expanded

$2x - 5x - 3$?

$x^2 + 2x + 1$

$x^2 + 2x + 4x + 8 =$
 $x^2 + 6x + 8$

$x^2 - 6x + 2x - 12 =$
 $x^2 - 4x - 12$

$5x + 4x - 6x - 4 =$
 $3x - 4$
 $3x^2 + 4x + 1$

To complete this task of "fill in the missing gap" this student is using rough working space to background each step.

$(x+a)(x+b)$
 via

$(x+a)(x+b)$

but not yet how to factorise. This task was chosen as a starter to

introduce "factorising"

Following this task and discussion of where these come from?

$(x+a)(x+b) = x^2 + (a+b)x + ab$

the students built up their own story for factorising (shown on next sample)

Factorised	Expanded
$(x-2)(x+4)$	$x^2 - 2x + 4x - 8 = x^2 + 2x - 8$ ✓
$(x+6)(x-2)$	$x^2 + 4x - 12$ ✓
$(2x+3)(2x-1)$	$4x^2 + 5x - 3 = 4x^2 + 5x - 3$ ✓
$(x+6)(x-2)$	$x^2 + 4x - 12$ ✓
$(x+4)(x+3)$	$x^2 + 7x + 12$ ✓
$(x+4)(x-3)$	$x^2 - 7x + 12$ ✓
$(2x+3)(2x-1)$	$4x^2 - 4x - 3$ ✓

Note how this student has realised that for this task she's guessing & checking.

$x^2 - 7x + 6$ guess + check → $(2x+2)(x+6)$

$x^2 - 4x - 12$ $(x+2)(x-6)$

$2x^2 - 9x - 5$ $(2x+3)(2x-2)$

$x^2 + 9x + 20$ $(x+4)(x+5)$

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

$3x^2 - x - 4$ $(3x+1)(x-4)$

$3x^2 - 13x + 4$ $(3x-2)(x-2)$

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

$3x^2 - 2x - 5x$ $3x^2 - 7x - 5$ $(3x+1)(x-5)$

$x^2 + 5x - 6$ $(x+6)(x-1)$

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

expanding

$(x+5)(x-1)$
 $(x+3)(x-4)$