Expanding triple brackets

Exit ticket ANSWERS Name _____

1 Expand and simplify $(x^2 + 2x + 3)(x + 4)$

$x^3 + 6x^2 + 11x + 12$

2 Expand and simplify $(x + 1)(x + 2)(x + 6)$

$x^3 + 9x^2 + 20x + 12$

3 Expand and simplify $(x + 5)(x + 1)(x - 3)$

$x^3 + 3x^2 - 13x - 15$

The Maths Habit

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1 **Expand and simplify** $(x^2 + 2x + 3)(x + 4)$

$x^3 + 6x^2 + 11x + 12$

TESTS A quadratic times a bracket: every term times every term

LOOK FOR $7x^2 + 11x + 12$ $x \times x^2$ taken as x^2: it is x^3

$x^3 + 2x^2 + 3x + 12$ the 4 multiplied only the 3: it multiplies every term

FIX IT Expand and simplify $(x^2 + 4x + 1)(x + 3)$. $x^3 + 7x^2 + 13x + 3$

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2 **Expand and simplify** $(x + 1)(x + 2)(x + 6)$

$x^3 + 9x^2 + 20x + 12$

TESTS Three brackets: two first, then that answer times the third

LOOK FOR $x^3 + 12$ only the x terms and the numbers multiplied

$x^2 + 4x + 8$ the third bracket added on, not multiplied

FIX IT Expand and simplify $(x + 2)(x + 3)(x + 1)$. $x^3 + 6x^2 + 11x + 6$

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3 **Expand and simplify** $(x + 5)(x + 1)(x - 3)$

$x^3 + 3x^2 - 13x - 15$

TESTS Three brackets with a negative term

LOOK FOR $x^3 + 3x^2 - 13x + 15$ $-3 \times 5 = -15$: a negative times a positive is negative

$x^3 + 3x^2 + 23x - 15$ $-3 \times 6x = -18x$, so $5x - 18x = -13x$

FIX IT Expand and simplify $(x + 2)(x + 3)(x - 1)$. $x^3 + 4x^2 + x - 6$