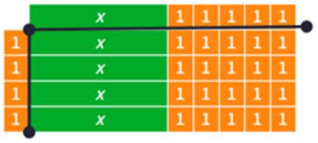
Expanding Single Brackets

To **expand a single bracket,** multiply the term outside of the bracket by each term inside the bracket. (Images were created using free virtual manipulatives available at Polypad.com.)

To expand a single bracket:

1. Represent the problem using algebra tiles.
2. Multiply the term outside the bracket by each term inside the bracket using the tiles. The terms may be a single number or a variable, or a number and a variable multiplied together. Terms can be negative or positive.
3. State the final answer.
4. Practice with algebra tiles until you feel confident.
5. When you are ready, try sketching the tiles. Finally, use a multiplication grid to expand the brackets.

Expand $4(x + 5)$



x	x	5
4	$4x$	20

$$4 \times x = 4x$$
$$4 \times 5 = 20$$
$$4x + 20$$

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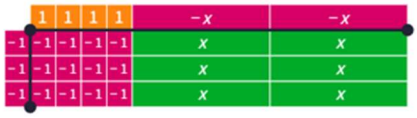
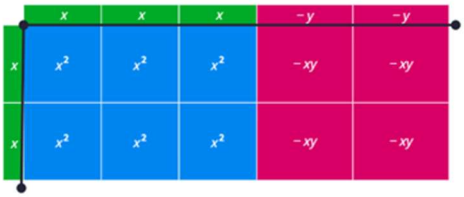
Expand $-3(4 - 2x)$



x	4	$-2x$
-3	-12	$6x$

$$-3 \times 4 = -12$$
$$-3 \times -5x = 6x$$
$$-12 + 6x$$

Expand $2x(3x - 2y)$



x	$3x$	$-2y$
$2x$	$6x^2$	$-4xy$

$$2x \times 3x = 6x^2$$
$$2x \times -2y = -4xy$$
$$6x^2 - 4xy$$

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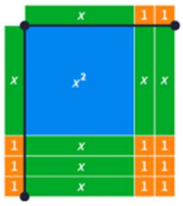
Expanding Double Brackets

To **expand a double bracket,** multiply each term in the first bracket by each term in the second bracket. (Images were created using free virtual manipulatives available at Polypad.com.)

To expand a double bracket:

1. Represent the problem using algebra tiles.
2. Multiply each term in the first bracket by each term in the second bracket using the tiles.
3. State the final answer, simplifying it by collecting like tiles.
4. Practice with algebra tiles until you feel confident.
5. When you are ready, try sketching the tiles. Finally, use a multiplication grid to expand the brackets.

Expand and simplify $(x + 2)(x + 3)$



x	x	2
x	x^2	$2x$
3	$3x$	6

$x^2 + 2x + 3x + 6$
$x^2 + 5x + 2$

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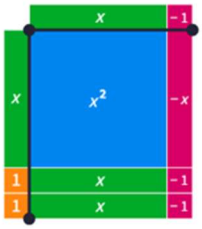
Expanding Single Brackets

To **expand a single bracket,** multiply the term outside of the bracket by each term inside the bracket. (Images were created using free virtual manipulatives available at Polypad.com.)

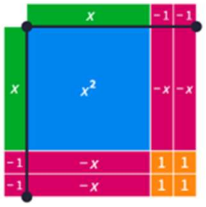
Expand and simplify $(x + 2)(x - 1)$



x	x	2
x	x^2	$2x$
-1	$-x$	-2

$x^2 + 2x - x - 2$
$x^2 + x - 2$

Expand and simplify $(x - 2)^2$



x	x	-2
x	x^2	$-2x$
-2	$-2x$	-4

$x^2 - 2x - 2x + 4$
$x^2 - 4x + 4$

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Expanding Triple Brackets

To **expand a triple bracket**, multiply each term in the first bracket by each term in the second bracket to create a new expression. Then multiply each term in this new expression by each term in the third bracket. (Images were created using free virtual manipulatives available at Polypad.com.)

To expand a triple bracket:

1. Draw a grid and algebra tiles to represent multiplying the first bracket by the second bracket.
2. Multiply each term in the first bracket by each term in the second bracket. Draw the solution.
3. Write out the terms you have drawn. Simplify the expression by collecting like terms.
4. Multiplying the new expression by the third bracket using steps 1 to 3.
5. Keep drawing the problem until you feel confident.
6. Expand the brackets using a multiplication grid when ready.

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

x	x	2
x	x^2	$2x$
1	x	2

$x^2 + 2x + x + 2$
$x^2 + 3x + 2$

x	x^2	$3x$	2
x	x^3	$3x^2$	$2x$
3	$3x^2$	$9x$	6

$x^3 + 3x^2 + 2x + 3x^2 + 9x + 6$
$x^3 + 6x^2 + 11x + 6$

Expanding Triple Brackets

To **expand a triple bracket**, multiply each term in the first bracket by each term in the second bracket to create a new expression. Then multiply each term in this new expression by each term in the third bracket. (Images were created using free virtual manipulatives available at Polypad.com.)

Expand and simplify $(x + 2)^2(x - 2)$

x	x	2
x	x^2	$2x$
2	$2x$	4

$x^2 + 2x + 2x + 4$
$x^2 + 4x + 4$

x	x^2	$4x$	4
x	x^3	$4x^2$	$4x$
-2	$-2x^2$	$-8x$	-8

$x^3 + 4x^2 + 4x + -2x^2 + -8x - 8$
$x^3 + 2x^2 - 4x - 8$