

1. Multiplying a binomial by a constant

Determine the product of $3 \times (2x + 5)$

Solution

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The diagram shows a rectangle divided into six smaller rectangles by one vertical and one horizontal line. The vertical line is labeled x on the left and $2x$ on the top. The horizontal line is labeled 3 on the left and 5 on the top. The six smaller rectangles have dimensions $(x, 3)$, $(2x, 3)$, $(x, 5)$, $(2x, 5)$, $(x, 3)$, and $(2x, 5)$ respectively, representing the terms in the expansion of $(2x+5)(x+3)$.

Step 3: $3 \times (2x + 5)$ = the area of the rectangle formed.
= the number of tiles that form the rectangle.

$$3 \times (2x + 5) = 6x + 15$$

2. Multiplying a binomial by a monomial

Determine the product of $y(2x - 3)$

Solution

Step 2: Fill tiles to form a rectangle with sides as y units and $(2x - 3)$ units.

A diagram showing a rectangle with width $2x$ and height y , and a separate vertical bar with width -3 .

So, $y(2x - 3) = 2xy - 3y$

3. Multiplying a binomial by a binomial

Determine the product of $(2x - 3)(4x + 3)$

Solution

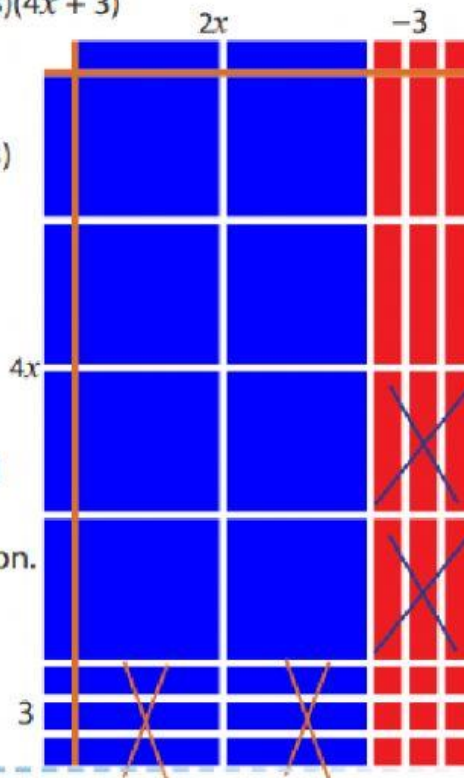
Step 1: Arrange tiles that represent $(2x - 3)(4x + 3)$

Step 2: Fill tiles to form a rectangle with sides as $(4x + 3)$ units and $(2x - 3)$ units.

Step 3: Remove zero pairs and count the remaining terms to get the solution.

So,

$$(2x - 3)(4x + 3) = 8x^2 - 6x - 9$$



4. Multiplying a binomial by a monomial

$$(x)(a+b) = ax + bx$$

5. Multiplying a binomial by a binomial

$$(ax + b) \times (cx + d) = acx^2 + adx + bcx + bd$$

$$(ax + b) \times (cx + d) = acx^2 + (ad + bc)x + bd$$