

## Multiplying Binomials using FOIL

FOIL is the name given to the method used when multiplying two binomials (polynomials with two terms). FOIL stands for **F**irst, **I**nside, **O**utside, **L**ast.

Suppose we were multiplying together:

$$(a + b)(c + d)$$

FOIL tells us that we need to start by multiplying the **first** terms of  $(a + b)$  and  $(c + d)$ . This would give us  $ac$ .

Next, we need to multiply the **outside** terms, this would give us  $ad$ .

Now, we multiply the **inside** terms giving  $bc$ .

And finally, we multiply the **last** terms giving  $bd$ .

We sum each of these together to get a final answer of:

$$ac + ad + bc + bd$$

Just remember **FOIL**, and you should be in good shape!

When doing these questions, remember  $a \times a = a^2$ , not  $2a$ . Also, if you multiply two negative numbers or two positive numbers, the answer will be positive. If you multiply two numbers where one is positive and one is negative, the answer will be negative.

Try these questions:

1.  $(5 + b)(2 + b) =$

2.  $(2a + c)(3c + b) =$

3.  $(mn - m^2)(-n + m) =$

4.  $(5k + 3b)(b + 2k) =$

5.  $(-5k - 3b)(-b - 2k) =$

6.  $(-2a + 3b)(a^2b + b^2a) =$

7.  $(x^6 + 9xy)(-x - 4y) =$

8.  $(k^4 + 2kn)(-7k + kn^2) =$

9.  $(3z - 3z^2)(2z + 2z^3) =$

10.  $(2xyz + 6x^2yz^2)(xy + 1 + xz) =$