

## Difference of Squares

“Difference of Squares” is the name of a type of shortcut you can take when multiplying two binomials if they have certain properties. Namely, if you are multiplying something of the form:

$$(a + b)(a - b)$$

Notice that the two binomials are exactly the same **except** for the sign of the last term. One is negative, the other is positive. So, what’s the shortcut? Look what happens when we use the FOIL method to multiply them out:

$$= a^2 + ba - ab - b^2$$

$$= a^2 - b^2$$

The middle two terms cancel and we’re left with the first term of the binomial squared minus the second term of the binomial squared: hence the name, difference of squares.

You can only use this short cut if you have two binomials of the form above. If you don’t have it in this form, you can’t use the shortcut!

Here are some problems for you to try

1.  $(4a - 3b)(4a + 3b) =$

2.  $(kx + 5)(kx - 5) =$

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

4.  $(3a + 5x)(3a - 5x) =$

5. For this question, look at each equation below and tell whether the difference of squares method can be used or not. If it can't be used, explain why. If it can be used, calculate the answer.

a.  $(x + y)(x - 2y)$

b.  $(x + y)(x^2 - y^2)$

c.  $(x - 2y)(2x + y)$

d.  $(x - y)(y - x)$

e.  $(x - y)(y + x)$

6.  $(11s - 1)(11s + 1) =$

7.  $(8q + 3pq)(8q - 3pq) =$

8.  $(mn + 5n^2)(-5n^2 + mn) =$

9.  $(4xyz - 2xy)(4xyz + 2xy) =$

10.  $(x - y)(x + y)(x^2 + y^2) =$

(Hint: Multiply the first two binomials, then multiply the result with the second binomial)