

YOU & MATHS **Prove it!** Prove that the following statements are true.

a. $(5 + 3)(5 - 3) = 5 \cdot 5 - 3 \cdot 3$

b. $(4 + 5)(4 - 5) = 4 \cdot 4 - 5 \cdot 5$

Which is the general rule that holds in this case?

a. You can calculate each side of the equality:

$$(5 + 3)(5 - 3) = 8 \cdot 2 = 16$$

and

$$5 \cdot 5 - 3 \cdot 3 = 25 - 9 = 16.$$

b. You can calculate each side of the equality:

$$(4 + 5)(4 - 5) = 9 \cdot (-1) = -9$$

and

$$4 \cdot 4 - 5 \cdot 5 = 16 - 25 = -9.$$

Note that:

$$(5 + 3)(5 - 3) = 5 \cdot 5 - \cancel{5 \cdot 3} + \cancel{3 \cdot 5} - 3 \cdot 3 = 5 \cdot 5 - 3 \cdot 3$$

$$(4 + 5)(4 - 5) = 4 \cdot 4 - \cancel{4 \cdot 5} + \cancel{5 \cdot 4} - 5 \cdot 5 = 4 \cdot 4 - 5 \cdot 5$$

The general rule is:

$$(a + b)(a - b) = a \cdot a - b \cdot b.$$