Guide to: Substitution

maths Links

Explanation:

Substitution means replacing letters in an algebraic expression or formula with their given numerical values. Always write **brackets** around any negative number you substitute — especially when squaring: **$(-3)^2 = +9$**, whereas -3^2 on a calculator gives -9.

Follow the order of operations (**BIDMAS**): work out **B**rackets first, then **I**ndices (powers/roots), then **D**ivision and **M**ultiplication, and finally **A**ddition and **S**ubtraction. Remember that **$3a$** means **$3 \times a$**.

Example 1: Find the value of **$4a - 3b$** when **$a = 5$** and **$b = -2$**.

Solution:

Substitute using brackets: $4(5) - 3(-2)$
Multiply: $4 \times 5 =$ **20** and $-3 \times -2 =$ **+6**
$= 20 + 6 = 26$
Answer: 26

Example 2: Given **$v = u^2 + 2as$**, find v when **$u = -4$**, **$a = 3$**, and **$s = 5$**.

Solution:

Substitute: $v = (-4)^2 + 2(3)(5)$
Indices first: $(-4)^2 = -4 \times -4 =$ **16**
Multiply: $2 \times 3 \times 5 =$ **30**
Add: $v = 16 + 30 = 46$ → **Answer: $v = 46$**

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ken@mathslinks.co.uk