WORKIT!

Simplify these expressions.

a $4x^2 + 6x - x + 6x^2 + 3$

> **Rearrange with the like terms grouped together.**

$4x^2 + 6x - x + 6x^2 + 3 = 4x^2 + 6x^2 + 6x - x + 3$

$= 10x^2 + 5x + 3$

> **Always give answers in descending powers (e.g. x^3, then x^2, then x and finally ordinary numbers (e.g. 2)).**

b $6a - b - c + a - 4a + c$

$6a - b - c + a - 4a + c = 6a + a - 4a - b - c + c = 3a - b$

> **Always look at both the sign and the value of a letter or number.**

c $4yx + x^2 + 6xy - 4x^2$

$4yx + x^2 + 6xy - 4x^2 = 4xy + 6xy + x^2 - 4x^2 = 10xy - 3x^2$

> **Although the order of the letters in a term does not matter ($4yx$ is the same as $4xy$), the convention is to write the number and then the letters in alphabetical order.**

Substituting numerical values into formulae and expressions

This is the sort of calculation you often do in other subjects such as physics and chemistry. Replace each letter in the formula or expression with the numerical value given in the question and calculate.

WORKIT!

In the formula $p = \frac{nRT}{v}$, find the value of p if $n = 5$, $R = 8.31$, $v = 3$ and $T = 298$. Give your answer to 3 significant figures.

$p = \frac{nRT}{v} = \frac{5 \times 8.31 \times 298}{3}$

> **Write the equation and replace each letter by its value.**

$= 4127.3$

$= 4130$ (to 3 s.f.)

> **Always check the question to see how many decimal places or significant figures should be used.**

WORKIT!

$s = ut + \frac{1}{2}at^2$ Find the value of s when $u = 25$, $t = 2.5$ and $a = -10$.

$s = 25 \times 2.5 + \frac{1}{2} \times (-10) \times 2.5^2$

$= 62.5 - 31.25$

> **Notice the use of BIDMAS.**

$= 31.25$

DOIT!

Write an example of an equation, expression, etc. on different cards. Write the terms on another set of cards. Practise matching the cards.

NAILIT!

$s = ut + \frac{1}{2}at^2$ is called an equation of motion, where s is distance, u is initial velocity, t is time and a is acceleration.

CHECKIT!

1 Identify whether each of the following is a formula, expression, equation or identity.

a $s = ut + \frac{1}{2}at^2$

b $2(x^2 + y^2) = 2x^2 + 2y^2$

c $4x^3y^2$

d $(x^2y)^3 = x^6y^3$

e $2x + 1 = 3$

2 Simplify

a $15x^2 - 4x + x^2 + 9x - x - 6x^2$

b $7a + 5b - b - 4a - 5b$

c $8yx + 5x^2 + 2xy - 8x^2$

d $\frac{1}{2}x^3 + 3x - 5 + 2\frac{1}{2}x^3 - 4x$

3 If $P = I^2R$, find P when $I = \frac{2}{3}$ and $R = 36$.

4 Using $v = u + at$, find v when $u = 20$, $a = -8$ and $t = 2$.