

Substitution 1 (substituting positive numbers)

Starter

1. (Review of last lesson)

Expand and simplify: (a) $(5x - 1)(2x - 3)$ (b) $(6 - n)(2n + 1)$

Working: (a) $(5x - 1)(2x - 3) = 10x^2 - 15x - 2x + 3$
 $= 10x^2 - 17x + 3$

(b) $(6 - n)(2n + 1) = 12n + 6 - 2n^2 - n$
 $= 6 + 11n - 2n^2$

E.g. 1 Let $a = 4$ and $b = 9$. Find the value of:

(a) $6a$ (b) $a - b$ (c) $5a + b$ (d) $8b - 7a$

Working: (a) $6a = 6 \times 4$ (b) $a - b = 4 - 9$
 $= 24$ $= -5$

(c) $5a + b = 5 \times 4 + 9$ (d) $8b - 7a = 8 \times 9 - 7 \times 4$
 $= 20 + 9$ $= 72 - 28$
 $= 29$ $= 44$

E.g. 2 Let $x = 2$, $y = 5$ and $z = 7$. Find the value of:

(a) $3x$ (b) $y + z$ (c) $x + 4y$
(d) $6x + 11z$ (e) $8y - 3z$

Working: (a) $3x = 3 \times 2$ (b) $y + z = 5 + 7$
 $= 6$ $= 12$

(c) $x + 4y = 2 + 4 \times 5$ (d) $6x + 11z = 6 \times 2 + 11 \times 7$
 $= 22$ $= 12 + 77$
 $= 89$

(e) $8y - 3z = 8 \times 5 - 3 \times 7$
 $= 40 - 21$
 $= 19$

E.g. 3 The cost, in £, of hiring a car is given by the formula $C = 2m + 30$, where m is the miles travelled. How much will it cost if you travel 200 miles?

Working: $m = 200 \Rightarrow C = 2m + 30$
 $= 2 \times 200 + 30$
 $= 430$ £430

It will cost £430 if you travel 200 miles

E.g. 4 The formula for velocity is given by $v = u + at$. Calculating the value of v when $u = 3$, $a = 10$ and $t = 2$.

Working:

$$\begin{aligned}v &= u + at \\&= 3 + 10 \times 2 \\&= 3 + 20 \\&= 23\end{aligned}$$

Video: [Substitution](#)

[Solutions to Starter and E.g.s](#)

Exercise

p3 Ex 12.1 Qu 1ace..., 2ace..., 3ace..., 4ace..., 5ace..., 6

[Textbook answers \(only available during a lockdown\)](#)