Substitution 2 (substituting negative numbers)

Starter

1. **(Review of last lesson)** Given that $h = \frac{m}{n} + m^2$, find h when $m = 6$ and $n = 2$.

Working:
$$\begin{aligned} h &= \frac{m}{n} + m^2 \\ &= \frac{6}{2} + 6^2 \\ &= 3 + 36 \\ &= 39 \end{aligned}$$

2. **(Review of Y7 material)**
Find the value of: (a) $6 - 11$ (b) $-12 + 8$ (c) $-7 - 16$

Working: (a) $6 - 11 = -5$

(b) $-12 + 8 = -4$

(c) $-7 - 16 = -23$

3. **(Review of Y7 material)**
Evaluate: (a) -9×2 (b) $-42 \div -6$ (c) 7×-8

Working: (a) $-9 \times 2 = -18$

(b) $-42 \div -6 = 7$

(c) $7 \times -8 = -56$

E.g. 1 If $a = 3, b = -2, c = 8$ and $d = -4$, evaluate:
(a) $a^2 + 2$ (b) b^3 (c) $4a(b - 5)$
(d) $3b^2 + d^3$ (e) $2a^2 - 5b$ (f) $2a^3 + 7$

Working: (a) $a^2 + 2 = 3^2 + 2 = 9 + 2 = 11$

(b) $b^3 = (-2)^3 = (-2) \times (-2) \times (-2) = 4 \times (-2) = -8$

(c) $4a(b - 5) = 4 \times 3(-2 - 5) = 12 \times (-7) = -84$

(d) $3b^2 + d^3 = 3 \times (-2)^2 + (-4)^3 = 3 \times 4 + (-64) = 12 - 64 = -52$

N.B. $(-4)^3 = (-4) \times (-4) \times (-4) = 16 \times (-4) = -64$

(e) $2a^2 - 5b = 2 \times 3^2 - 5 \times (-2)$
$= 2 \times 9 + 10$
$= 18 + 10$
$= 28$

(f) $4b^3 + 7 = 4 \times (-2)^3 + 7$
$= 4 \times (-8) + 7$
$= -32 + 7$
$= -25$

N.B. $(-2)^3 = (-2) \times (-2) \times (-2) = 4 \times (-2) = -8$

Video: Substitution

Solutions to Starter and E.g.s

Exercise
p9 Ex 12.2 Qu 1ace…, 2ace…, 3ace…, 4-11

Textbook answers (only available during a lockdown)