Simplifying Expressions & Substitution

Practice Worksheet (Foundation · Target Grade 5)

I Do

(a) Simplify $5a + 3b - 2a + 7b$.

..... *(2 marks)*

(b) $T = 4m - 3n$
Work out the value of T when $m = 6$ and $n = -2$.

$T =$ ..... *(2 marks)*

(Total for Question is 4 marks)

We Do

(a) Simplify $7x + 2y - 3x + 5y$.

..... *(2 marks)*

(b) $P = 5c - 2d$
Work out the value of P when $c = 4$ and $d = -3$.

$P =$ ..... *(2 marks)*

(Total for Question is 4 marks)

You Do 1

(a) Simplify $8p + 4q - 5p + 6q$.

..... *(2 marks)*

(b) $R = 3x - 4y$
Work out the value of R when $x = 5$ and $y = -3$.

$R =$ ..... *(2 marks)*

(Total for Question is 4 marks)

You Do 2

(a) Simplify $6m + 9n - 2m - 4n$.

..... *(2 marks)*

(b) $W = 6a - 5b$
Work out the value of W when $a = 3$ and $b = -4$.

$W =$ ..... *(2 marks)*

(Total for Question is 4 marks)

You Do 3

(a) Simplify $9c - 2d - 4c + 8d$.

..... *(2 marks)*

(b) $K = 2p - 7q$
Work out the value of K when $p = 8$ and $q = -2$.

$K =$ ..... *(2 marks)*

(Total for Question is 4 marks)

Challenge 1

(a) Expand and simplify $3(2a + 5b) - 2(a - 4b)$.

..... *(2 marks)*

(b) $V = 3x^2 - 4y$
Work out the value of V when $x = -3$ and $y = -5$.

$V =$ ..... *(2 marks)*

(Total for Question is 4 marks)

Challenge 2

(a) Simplify $4x^2 + 3x - 2x^2 - 7x + 5$.

..... *(2 marks)*

(b) $H = 5p - 4q$
Given that $H = 38$ and $q = -2$, work out the value of p.

$p =$ ..... *(2 marks)*

(Total for Question is 4 marks)

Extreme Challenge

$A = 3x + 2y$ and $B = 2x - 5y$.

(a) Find a simplified expression for $4A - 3B$ in terms of x and y.

..... *(2 marks)*

(b) Given that $T = 4A - 3B$, and that $T = 45$ when $x = -4$, work out the value of y.
You must show all of your algebraic working clearly.

$y =$ ..... *(3 marks)*

(Total for Question is 5 marks)

Worked Answers

I Do
(a) Collect like terms: $(5a - 2a) + (3b + 7b) = \mathbf{3a + 10b}$.
(b) $T = 4(6) - 3(-2) = 24 - (-6) = 24 + 6 = \mathbf{30}$.

We Do
(a) $(7x - 3x) + (2y + 5y) = \mathbf{4x + 7y}$.
(b) $P = 5(4) - 2(-3) = 20 - (-6) = 20 + 6 = \mathbf{26}$.

You Do 1
(a) $(8p - 5p) + (4q + 6q) = \mathbf{3p + 10q}$.
(b) $R = 3(5) - 4(-3) = 15 - (-12) = 15 + 12 = \mathbf{27}$.

You Do 2
(a) $(6m - 2m) + (9n - 4n) = \mathbf{4m + 5n}$.
(b) $W = 6(3) - 5(-4) = 18 - (-20) = 18 + 20 = \mathbf{38}$.

You Do 3
(a) $(9c - 4c) + (-2d + 8d) = \mathbf{5c + 6d}$.
(b) $K = 2(8) - 7(-2) = 16 - (-14) = 16 + 14 = \mathbf{30}$.

Challenge 1
(a) Expand both brackets carefully:
$3(2a + 5b) - 2(a - 4b) = 6a + 15b - 2a + 8b = \mathbf{4a + 23b}$.
(b) Substitute $x = -3$ and $y = -5$:
$V = 3(-3)^2 - 4(-5) = 3(9) - (-20) = 27 + 20 = \mathbf{47}$.

Challenge 2

(a) Collect x^2 terms, x terms, and constants separately:
$(4x^2 - 2x^2) + (3x - 7x) + 5 = \mathbf{2x^2 - 4x + 5}$.

(b) Substitute $H = 38$ and $q = -2$ into $H = 5p - 4q$:
$38 = 5p - 4(-2)$
$38 = 5p + 8$
$30 = 5p \implies \mathbf{p = 6}$.

Extreme Challenge

(a) Substitute the expressions for A and B:
$4A - 3B = 4(3x + 2y) - 3(2x - 5y)$
$= 12x + 8y - 6x + 15y = \mathbf{6x + 23y}$.

(b) Substitute $T = 45$ and $x = -4$ into $T = 6x + 23y$:
$45 = 6(-4) + 23y$
$45 = -24 + 23y$
$69 = 23y \implies \mathbf{y = 3}$.