

Exercise walk-through

E2.1

Introduction to algebra

IGCSE Mathematics

You must be able to

- substitute numbers into an expression
- collect like terms to simplify
- use correct order of operations with letters

1

The method

Method — Substituting and simplifying

- **Substitute:** $3x^2 - 2y$ with $x = 4$, $y = 5 \rightarrow 3(16) - 10 = 38$.
- **Like terms** : same letters $\rightarrow$ combine. $2a^2 + 5a^2 = 7a^2$;
 $3ab - 9ab = -6ab$.
- **Worked:** $2a^2 + 3ab - 1 + 5a^2 - 9ab + 4 = 7a^2 - 6ab + 3$.

Answer shapes: **M1** a correct method, **A1** the correct answer.

Exercises 2.1·2.3

2.1 Find the value of $4x - 3y$ when $x = 5$ and $y = 2$.

[2]

2.2 Simplify $7p + 2q - 3p + 5q$.

[2]

2.3 Find the value of $2x^2 + 1$ when $x = -3$.

[2]

Exercises 2.1·2.3

2.1 Find the value of $4x - 3y$ when $x = 5$ and $y = 2$.

[2]

2.1

- substitute $x = 5$, $y = 2$
 - $4(5) - 3(2) = 20 - 6 = \mathbf{14}$
-

2.2 Simplify $7p + 2q - 3p + 5q$.

[2]

2.2

- collect like terms
 - $7p - 3p + 2q + 5q = \mathbf{4p + 7q}$
-

2.3 Find the value of $2x^2 + 1$ when $x = -3$.

[2]

2.3

- $(-3)^2 = 9$
- $2(9) + 1 = \mathbf{19}$

Exercises 3.1·3.2

3.1 Simplify $5a^2 - 2ab + 3 - a^2 + 6ab$.

[2]

3.2 Find the value of $\frac{2a+b}{a-b}$ when $a = 7$ and $b = 1$.

[2]

Exercises 3.1·3.2

3.1 Simplify $5a^2 - 2ab + 3 - a^2 + 6ab$.

[2]

3.1

- $5a^2 - a^2 = 4a^2$, $-2ab + 6ab = 4ab$
- **$4a^2 + 4ab + 3$**

3.2 Find the value of $\frac{2a+b}{a-b}$ when $a = 7$ and $b = 1$.

[2]

3.2

- substitute $a = 7$, $b = 1$

$$\frac{2(7) + 1}{7 - 1} = \frac{15}{6} = \frac{\mathbf{5}}{\mathbf{2}}$$

Exercise 3.3

3.3 Find the value of $3x^2 - 5x$ when $x = -2$.

[2]

Exercise 3.3

3.3 Find the value of $3x^2 - 5x$ when $x = -2$.

[2]

3.3

- $(-2)^2 = 4$ and $-5(-2) = 10$
- $3(4) + 10 = \mathbf{22}$