



Simplifying and Substituting (F)

Intervention Booklet

Name: _____

Class: _____

Useful websites:

www.mathswatchvle.com

(Video explanations and questions)

Username: STH...@twgash

Password: stmaths

www.methodmaths.com

(Past papers online that get instantly marked)

Centre ID: wga

Username: firstname

Password: lastname

www.hegartymaths.com

(Online tutorials and quizzes)

Login: first name and last name are case sensitive

www.bbc.co.uk/schools/gcsebitesize/math

Substitution

Things to remember:

- There is always 1 mark just for writing down the numbers you have had to put into the expression.
- Your answer must be a number – don't forget to finish the sum
- The question will always use the words "Work out the value of"

Questions:

1. (a) Work out the value of $3x - 4y$ when $x = 3$ and $y = 2$

.....
(2)

(b) Work out the value of $\frac{p(q-3)}{4}$ when $p = 2$ and $q = -7$

.....
(3)
(Total 5 marks)

2. Find the value of $t^2 - 4t$ when $t = -3$

.....
(Total 2 marks)

3. $P = x^2 - 7x$
Work out the value of P when $x = -5$

$P =$
(Total 2 marks)

4. T, x and y are connected by the formula
 $T = 5x + 2y$
 $x = -3$ and $y = 4$
(a) Work out the value of T.

T =
(Total 2 marks)

Collecting Like Terms (Simplifying)

Things to remember:

- $2a$ means $a + a$ or 2 lots of a
- a^2 means $a \times a$
- The sign (+ or -) belongs to the term following it. You may find it easier to identify like terms using two different highlighters.

Questions:

1. (a) Simplify $a + a + a + a$

.....
(1)

(b) Simplify $3 \times c \times d$

.....
(1)

(c) Simplify $3ef + 5ef - ef$

.....
(1)
(Total for Question is 3 marks)

2. (a) Simplify $b + b + b + b$

.....
(1)

(b) Simplify $8n - 3n$

.....
(1)

(c) Simplify $3 \times c \times d$

.....
(1)

(d) Simplify $3x + 7y + 2x - y$

.....
(2)
(Total for Question is 5 marks)

3. Simplify $3x + 5y + x + 4y$

.....
(Total for Question is 2 marks)

4. (a) Simplify $a \times c \times 3$

(b) Simplify $p \times p \times p$

.....
(1)

(c) Simplify $5x - 4y + 3x - 3y$

.....
(1)

.....
(2)
(Total for Question is 4 marks)

5. (a) Simplify $5a - 2a$

(b) Simplify $3 \times 4y$

.....
(1)

(c) Simplify $3e + 4f + 2e - f$

.....
(1)

.....
(2)
(Total for Question is 4 marks)

6. (a) Simplify $m + m + m$

.....
(1)

(b) Simplify $9e - 2e$

.....
(1)

(c) Simplify $5 \times 3g$

.....
(1)

(Total for Question is 3 marks)

Expanding and Factorising (Single Brackets)

Things to remember:

- Expand brackets means to multiply what is outside the bracket with everything inside the bracket.
- Factorising is the opposite of expanding – put the HCF outside the brackets to factorise fully.

Questions:

1. (a) Expand $5(m + 2)$

.....
(1)

(b) Factorise $y^2 + 3y$

.....
(1)

(c) Simplify $a^5 \times a^4$

.....
(1)

(Total for Question is 3 marks)

2. (a) Expand $2m(m + 3)$

.....
(1)

(b) Factorise fully $3xy^2 - 6xy$

.....
(2)

(Total for Question is 3 marks)

3. (a) Expand $3(x + 4)$

.....
(1)

(b) Expand $x(x^2 + 2)$

.....
(2)

(c) Factorise $x^2 - 6x$

.....
(1)

(Total for Question is 4 marks)

4. (a) Expand and simplify $5(x + 7) + 3(x - 2)$

.....
(2)

(b) Factorise completely $3a^2b + 6ab^2$

.....
(2)
(Total for Question is 4 marks)

5. (a) Expand $3(2y - 5)$

.....
(1)

(b) Factorise completely $8x^2 + 4xy$

.....
(2)
(Total for Question is 3 marks)

Expand and Factorise Quadratics

Things to remember:

- Use FOIL (first, outside, inside, last) or the grid method (for multiplication) to expand brackets.
- For any quadratic $ax^2 + bx + c = 0$, find a pair of numbers with a sum of b and a product of ac to factorise.

Questions:

1. Expand and simplify $(m + 7)(m + 3)$

.....
(Total for question = 2 marks)

2. (a) Factorise $6 + 9x$

.....
(1)

(b) Factorise $y^2 - 16$

.....
(1)

(c) Factorise $2p^2 - p - 10$

.....
(2)

(Total for Question is 4 marks)

3. Solve, by factorising, the equation $8x^2 - 30x - 27 = 0$

.....
(Total for Question is 3 marks)

4. Factorise $x^2 + 3x - 4$

.....
(Total for question is 2 marks)

5. Write $x^2 + 2x - 8$ in the form $(x + m)^2 + n$ where m and n are integers.

.....
(Total for question is 2 marks)

6. (a) Expand $4(3x + 5)$

.....
(1)

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

.....
(2)

(c) Expand and simplify $(x + 4)(x + 6)$

.....
(2)

(Total for Question is 5 marks)

7. (a) Factorise $x^2 + 5x + 4$

.....
(2)

(b) Expand and simplify $(3x - 1)(2x + 5)$

.....
(2)

(Total for Question is 4 marks)

8. (a) Expand $3(2 + t)$ (1)
- (b) Expand $3x(2x + 5)$ (2)
- (c) Expand and simplify $(m + 3)(m + 10)$

..... (2)
(Total for Question is 5 marks)

9. (a) Factorise $x^2 + 7x$ (1)
- (b) Factorise $y^2 - 10y + 16$
- * (c) (i) Factorise $2t^2 + 5t + 2$ (2)

- (ii) t is a positive whole number.
 The expression $2t^2 + 5t + 2$ can never have a value that is a prime number.
 Explain why.

.....

.....

.....

..... (3)
(Total for Question is 6 marks)