

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Algebra

Simplifying expressions using the four operations

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

- In all calculations, show clearly how you work out your answer

For questions 1 to 7 you must **NOT** use a calculator.



Q1.

Simplify fully $8a + 5b + 6a - 2b$

(Total 2 marks)

Q2.

Simplify fully $8m + 4 - 2m + 7$

(Total 2 marks)

Q3.

Simplify $\frac{1}{2}c \times 6d$ fully

(Total 2 marks)

Q4.

Emma tries to simplify $cd \times 2$
Here is her method.

$$\begin{aligned} c \times 2 &= 2c \\ d \times 2 &= 2d \\ 2c \times 2d &= 4cd \end{aligned}$$

What is wrong with her method?

(Total 1 mark)

Questions 5 to 7 are **higher** tier only

Q5.

Simplify $a + 3a \div a$

(Total 1 mark)

Q6.

Which of these expressions is equivalent to $3a - a \times 4a + 2a$?

$$8a^2 + 2a$$

$$12a^2$$

$$5a - 4a^2$$

$$3a - 6a^2$$

(Total 1 mark)

Q7.

Simplify $16a^2 \div a + 3a \times 2$

Which of these is the answer?

$$22a$$

$$8a$$

$$38a$$

$$2a$$

(Total 1 mark)

For the rest of the questions, you **may** use a calculator.



Q8.

Simplify fully $x + 4x$

(Total 1 mark)

Q9.

Copy and complete these statements.

$$\underline{\hspace{2cm}} + 5x = 9x$$

$$y \times \underline{\hspace{2cm}} = y^2$$

$$\underline{\hspace{2cm}} - 2t = t$$

(Total 3 marks)

Q10.

Simplify $\frac{20w}{4w}$ fully

(Total 2 marks)

Q11.

Simplify fully $y \times y \times y$

(Total 1 mark)

Q12.

Simplify fully $5 \times 2w$

(Total 1 mark)

Q13.

Simplify fully $p^2 \times p$

(Total 1 mark)

Q14.

Simplify fully $2m \div m$

(Total 1 mark)

Q15.

Simplify fully $2x + 9y + 1 + 8x - 5y - 7$

(Total 3 marks)

Q16.

Which of these expressions is equivalent to $0.5a^2$?

$$a$$

$$\frac{a}{2}$$

$$\frac{a^2}{2}$$

$$\frac{a^2}{4}$$

(Total 1 mark)

Q17.

Simplify fully $3a + 5c - a + 6c$

(Total 2 marks)

Q18.

Simplify fully $n \div n$

(Total 1 mark)

Q19.

Simplify fully $\frac{1}{3} \times 6t$

(Total 1 mark)

Q20.

Match each expression on the left with one on the right.
One has been done for you.

$a + 3 + 2$	$a + 6$
$a + 3 \times 2$	$a + 5$
$a \times 3 \times 2$	$3a + 6$
$a \times 3 + 2$	$6a$
	$3a + 2$

(Total 3 marks)

Q21.

Simplify $4 \times 2c$

Which of these is the answer?

$42c$

$16c$

$8c$

$6c$

(Total 1 mark)

Q22.

Simplify fully $9x + y - 6x + y$

(Total 2 marks)

Q23.

Match each expression on the left with one on the right.
One has been done for you.

	$4ab$
$12ab \div 4$	$4 + a$
	$3ab$
$a + a + a + a$	
	$4a$
$4 \times a \times b$	
	a^4
$a \times a \times a \times a$	
	$2ab$
$a + a + b + b$	
	$2a + 2b$

(Total 4 marks)

Q24.

Simplify $8a - 3a + a$

Which of these is the answer?

$4a$

$6a$

$5 + a$

$8a - 3a^2$

(Total 1 mark)

Q25.

Simplify $5x^2 - x^2$

(Total 1 mark)

Q26.

Simplify $8x - 3 + 6x$

Which of these is the answer?

$2x - 3$

$11x$

$5 + 6x$

$14x - 3$

(Total 1 mark)

Q27.

Simplify fully $3a^2 + 7a + 3 - a^2 + 8a - 4$

(Total 3 marks)

Q28.

(a) Simplify $y \times y$

(1)

(b) Simplify $5a + 2 - a + 9$

(2)

(Total 3 marks)

Question 29 is **higher** tier only

Q29.

Simplify $\sqrt{5}a + \sqrt{5}a$

Which of these is your answer?

$5a$

$5a^2$

$2\sqrt{5}a$

$\sqrt{10}a$

(Total 1 mark)

Simplifying expressions using the four operations – Cross-topic questions (Foundation)

Q30.

Here is the term-to-term rule for a sequence.

Double the previous term and add 3

The first three terms of the sequence are $a + 1$ $2a + 5$ $4a + 13$

Show that the sum of the first **four** terms is a multiple of 3

(Total 3 marks)