

GCSE MATHEMATICS

Expanding Brackets

AQA-style Topic Practice

Based on AQA GCSE Mathematics (8300)

Tier: Foundation and Higher

Name

Date

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer all questions in the spaces provided.
- Do all rough work in this booklet.
- Section A: you must not use a calculator.
- Section B: you may use a calculator.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 48.
- The questions suit both Foundation and Higher tier students.
- Diagrams are not drawn accurately unless the question says they are.
- Graphs drawn on a grid are accurate.

Advice

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

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
TOTAL	

These are original practice questions written in the style of AQA GCSE Mathematics (8300). They are not official AQA examination questions and are not endorsed by AQA.

SECTION A

You must not use a calculator in this section.

- 1** (a) Circle the expression that is equivalent to $4(x + 3)$. **[1 mark]**

$4x + 3$

$4x + 7$

$4x + 12$

$x + 12$

- (b) Circle the expression that is equivalent to $2y \times 5y$. **[1 mark]**

$7y$

$10y$

$7y^2$

$10y^2$

- (c) Expand $-3(m - 2)$

Circle your answer.

[1 mark]

$-3m - 6$

$-3m + 6$

$-3m - 2$

$3m + 6$

- 2** Multiply out

- (a) $7(n + 2)$ **[1 mark]**

Answer _____

- (b) $3(4w - 5)$ **[1 mark]**

Answer _____

- (c) $5(2 - 3v)$ **[1 mark]**

Answer _____

- 3** Expand

- (a) $a(a - 8)$ **[1 mark]**

Answer _____

- (b) $4m(3m + 2)$ **[1 mark]**

Answer _____

3(c) $-2x(5x - 3)$

[1 mark]

Answer _____

4 Expand and simplify fully

(a) $5(x + 2) + 3(x - 1)$

[2 marks]

Answer _____

(b) $6(2t + 1) - 4(t - 3)$

[2 marks]

Answer _____

(c) $9y - 2(3y - 5)$

[2 marks]

Answer _____

- 5** Adult tickets for a show cost $\pounds(2x + 5)$ each.

Child tickets cost $\pounds x$ each.

Write an expression, in terms of x , for the total cost, in pounds, of 3 adult tickets and 4 child tickets.

[2 marks]

Answer _____

- 6** Expand and simplify fully

(a) $(x + 7)(x + 2)$

[2 marks]

Answer _____

(b) $(w - 4)(w - 5)$

[2 marks]

Answer _____

6(c) $(m - 3)(m + 8)$

[2 marks]

Answer _____

- 7 A student expands and simplifies $(x + 4)(x - 5)$

Here is the student's working.

$$x^2 - 5x + 4x + 20$$

$$= x^2 - x + 20$$

Make one criticism of the student's working.

[1 mark]

- 8 Expand and simplify fully

(a) $(3a - 2)(a + 4)$

[2 marks]

Answer _____

8(b) $(2x - 1)(4x - 3)$

[2 marks]

Answer _____

9 Expand and simplify fully

(a) $(x + 9)^2$

[2 marks]

Answer _____

(b) $(2y - 5)^2$

[2 marks]

Answer _____

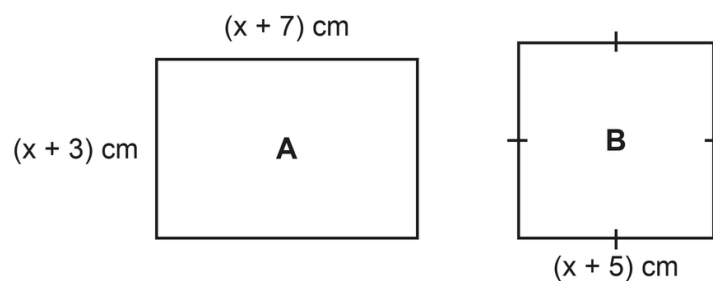
- 10** Kai says, " $2(x + 3)^2$ is equivalent to $(2x + 6)^2$."

Is Kai correct? You must show your working.

[2 marks]

- 11** Figure 1 shows a rectangle A and a square B.

Figure 1



Show that the area of rectangle A is 4 cm^2 less than the area of square B.

[3 marks]

12 $5(2x - p) + q(x + 4) \equiv 13x + 2$

Work out the values of p and q .

[3 marks]

Answer _____

13 Show that $(n + 4)(n + 1) - (n + 2)^2 \equiv n$

[3 marks]

SECTION B

You may use a calculator in this section.

14 (a) Expand $1.2(5x + 3.5)$

[1 mark]

Answer _____

(b) Expand and simplify fully $(x + 2.5)(x - 1.2)$

[2 marks]

Answer _____

15 A rectangular rug is $(2x + 0.8)$ metres long and $(x - 0.3)$ metres wide.

Write an expression, in terms of x , for the area of the rug.

[2 marks]

Answer _____ m^2

END OF QUESTIONS

Mark scheme

Glossary: M marks are for a correct method which could lead to a correct answer. A marks are for an accurate answer and depend on the M mark before them. B marks are independent of method. M1dep is a method mark that depends on the previous method mark. ft means 'follow through', oe means 'or equivalent', and cao means 'correct answer only'.

Q	Answer	Mark	Comments
1(a)	$4x + 12$	B1	
	Additional Guidance If more than one answer is circled, award no mark		
1(b)	$10y^2$	B1	
	Additional Guidance If more than one answer is circled, award no mark		
1(c)	$-3m + 6$	B1	
	Additional Guidance If more than one answer is circled, award no mark		
Total		3	

Q	Answer	Mark	Comments
2(a)	$7n + 14$	B1	oe
2(b)	$12w - 15$	B1	oe; do not accept $12w - 5$
2(c)	$-15v + 10$	B1	oe, e.g. $10 - 15v$
Total		3	

Q	Answer	Mark	Comments
3(a)	$a^2 - 8a$	B1	oe; do not accept $2a - 8a$
3(b)	$12m^2 + 8m$	B1	oe; do not accept $12m + 8m$ or $7m^2 + 8m$
3(c)	$-10x^2 + 6x$	B1	oe; do not accept $-10x^2 - 6x$
Total		3	

Q	Answer	Mark	Comments
4(a)	$5x + 10 + 3x - 3$	M1	oe; at least three of the four terms correct
	$8x + 7$	A1	oe
Additional Guidance Correct answer implies M1			
4(b)	$12t + 6 - 4t + 12$	M1	oe; at least three of the four terms correct
	$8t + 18$	A1	oe
Additional Guidance - Correct answer implies M1 - Do not award A1 for $8t - 6$ or $8t + 3$			
4(c)	$9y - 6y + 10$	M1	oe; $-6y + 10$ seen
	$3y + 10$	A1	oe
Additional Guidance - Correct answer implies M1 - Do not award A1 for $3y - 10$ or $3y - 5$			
Total		6	

Q	Answer	Mark	Comments
5	$3(2x + 5) + 4x$	M1	oe, e.g. $6x + 15 + 4x$
	$10x + 15$	A1	oe
Additional Guidance - Correct answer implies M1 - Do not award A1 for $10x + 5$ or $6x + 4x + 15$ left uncollected			
Total		2	

Q	Answer	Mark	Comments
6(a)	$x^2 + 2x + 7x + 14$	M1	four terms correct ignoring signs, or three terms correct with signs
	$x^2 + 9x + 14$	A1	oe
	Additional Guidance Correct answer implies M1		
6(b)	$w^2 - 5w - 4w + 20$	M1	four terms correct ignoring signs, or three terms correct with signs
	$w^2 - 9w + 20$	A1	oe
	Additional Guidance - Correct answer implies M1 - Do not award A1 for $w^2 - 9w - 20$ or $w^2 + 20$		
6(c)	$m^2 + 8m - 3m - 24$	M1	four terms correct ignoring signs, or three terms correct with signs
	$m^2 + 5m - 24$	A1	oe
	Additional Guidance - Correct answer implies M1 - Do not award A1 for $m^2 - 5m - 24$ or $m^2 + 11m - 24$		
Total		6	

Q	Answer	Mark	Comments
7	4×-5 is -20 , not $+20$	B1	oe
	Additional Guidance - The criticism must identify the sign of the last term, e.g. "the last term should be -20" or "a positive times a negative is negative" - Do not award for "the answer should be $x^2 - x - 20$" on its own - Do not award for a criticism of the x terms, which are correct		
Total		1	

Q	Answer	Mark	Comments
8(a)	$3a^2 + 12a - 2a - 8$	M1	four terms correct ignoring signs, or three terms correct with signs
	$3a^2 + 10a - 8$	A1	oe
Additional Guidance Correct answer implies M1			
8(b)	$8x^2 - 6x - 4x + 3$	M1	four terms correct ignoring signs, or three terms correct with signs
	$8x^2 - 10x + 3$	A1	oe
Additional Guidance - Correct answer implies M1 - Do not award A1 for $8x^2 - 10x - 3$ or $6x^2 - 10x + 3$			
Total		4	

Q	Answer	Mark	Comments
9(a)	$(x + 9)(x + 9)$ or $x^2 + 9x + 9x + 81$	M1	oe
	$x^2 + 18x + 81$	A1	oe
Additional Guidance - Correct answer implies M1 - Do not award M1 for $x^2 + 81$ on its own			
9(b)	$(2y - 5)(2y - 5)$ or $4y^2 - 10y - 10y + 25$	M1	oe
	$4y^2 - 20y + 25$	A1	oe
Additional Guidance - Correct answer implies M1 - Do not award M1 for $4y^2 + 25$, $4y^2 - 25$ or $2y^2 - 20y + 25$ on their own			
Total		4	

Q	Answer	Mark	Comments
10	$2x^2 + 12x + 18$ or $4x^2 + 24x + 36$	M1	either expression correctly expanded
	No, with $2x^2 + 12x + 18$ and $4x^2 + 24x + 36$	A1	both correct and a conclusion
Additional Guidance - Alternative method: substituting a value of x, e.g. $x = 1$ gives $2 \times 4^2 = 32$ and $8^2 = 64$. M1 for one correct value; A1 for both correct values and "no" - A value of x that gives equal results cannot be used: only $x = -3$ does, where both are 0 - Do not award A1 for "no" without both expressions or both values			
Total		2	

Q	Answer	Mark	Comments
11	$(x + 7)(x + 3) = x^2 + 10x + 21$	M1	oe; area of A
	$(x + 5)^2 = x^2 + 10x + 25$	M1	oe; area of B
	$x^2 + 10x + 25 - (x^2 + 10x + 21) = 4$	A1	with a statement or clear comparison
Additional Guidance - The A1 needs both areas correctly expanded and the difference of 4 shown - Do not award A1 for checking a single value of x: that does not show it for every value			
Total		3	

Q	Answer	Mark	Comments
12	$10x - 5p + qx + 4q$	M1	oe; both brackets correctly expanded
	$10 + q = 13$ or $q = 3$	M1	x terms compared
	$p = 2$ and $q = 3$	A1	
Additional Guidance - Correct answers imply both M marks - Do not award A1 for $p = -2$			
Total		3	

Q	Answer	Mark	Comments
13	$(n + 4)(n + 1) = n^2 + 5n + 4$	M1	oe, e.g. $n^2 + n + 4n + 4$
	$(n + 2)^2 = n^2 + 4n + 4$	M1	oe; or $-n^2 - 4n - 4$ in a subtraction
	$n^2 + 5n + 4 - n^2 - 4n - 4 = n$	A1	fully correct working seen
Additional Guidance "Show that": the A1 needs both expansions and the subtraction seen, leading to n - Do not award A1 if $n^2 + 4n + 4$ has been subtracted as $-n^2 + 4n + 4$			
Total		3	

Q	Answer	Mark	Comments
14(a)	$6x + 4.2$	B1	oe
14(b)	$x^2 - 1.2x + 2.5x - 3$	M1	four terms correct ignoring signs, or three terms correct with signs
	$x^2 + 1.3x - 3$	A1	oe
Additional Guidance - Correct answer implies M1 - Do not award A1 for $x^2 + 1.3x + 3$ or $x^2 + 3.7x - 3$			
Total		3	

Q	Answer	Mark	Comments
15	$(2x + 0.8)(x - 0.3)$ or a correct expansion equivalent to $2x^2 - 0.6x + 0.8x - 0.24$	M1	oe. Award M1 for correctly forming the area as $(2x + 0.8)(x - 0.3)$ OR for a genuine correct expansion attempt with four terms correct ignoring signs, or three terms correct with signs. The correct final answer implies M1.
	$2x^2 + 0.2x - 0.24$	A1	oe
Additional Guidance • Correct answer implies M1. • Do not award A1 for $2x^2 - 0.24$. • Do not award A1 for $2x^2 + 0.2x + 0.24$. • An unsimplified product such as $(2x + 0.8)(x - 0.3)$ earns M1 only, not A1. • An expanded but uncollected expression equivalent to $2x^2 - 0.6x + 0.8x - 0.24$ earns M1 only unless it is simplified correctly.			
Total		2	

Elite Learners Assessment Objectives Summary

For teachers: how the marks in this paper divide between the three assessment objectives of AQA GCSE Mathematics (8300). This summary is not part of the AQA-style mark scheme.

AO1 — use and apply standard techniques	41 marks (85.4%)
AO2 — reason, interpret and communicate mathematically	4 marks (8.3%)
AO3 — solve problems within mathematics and in other contexts	3 marks (6.3%)
Total	48 marks