

GCSE MATHEMATICS

Expanding Brackets

Eduqas-style Topic Practice

Based on WJEC Eduqas GCSE (9–1) Mathematics (C300QS)

Tier: Foundation and Higher

Name _____

Date _____

ADDITIONAL MATERIALS

- A ruler, protractor and a pair of compasses may be required.
- Section A: the use of a calculator is not permitted.
- Section B: a calculator may be used.

INSTRUCTIONS TO CANDIDATES

- Use black ink or black ball-point pen. You may use a pencil for graphs and diagrams only.
- Answer all the questions in the spaces provided.

INFORMATION FOR CANDIDATES

- You should give details of your method of solution when appropriate.
- Unless stated, diagrams are not drawn to scale. Scale drawing solutions will not be acceptable where you are asked to calculate.
- The number of marks is given in brackets at the end of each question or part-question.
- The questions suit both Foundation and Higher tier students.
- You are reminded of the need for good English and orderly, clear presentation in your answers.
- The maximum mark for this paper is 48.

For Examiner's use only

Question	Maximum Mark	Mark Awarded
1.	3	
2.	3	
3.	3	
4.	2	
5.	2	
6.	4	
7.	2	
8.	6	
9.	4	
10.	2	
11.	2	
12.	4	
13.	3	
14.	3	
15.	3	
16.	2	
Total	48	

These are original practice questions written in the style of WJEC Eduqas GCSE Mathematics. They are not official WJEC Eduqas examination questions and are not endorsed by WJEC.

SECTION A

You must not use a calculator in this section.

1. Expand each of the following.

(a) $3(m + 7)$ [1]

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(b) $9(2n - 1)$ [1]

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(c) $4(5 - 2w)$ [1]

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2. Simplify each of the following.

(a) $4a \times 3a$ [1]

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.....

(b) $5x \times 2y$ [1]

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(c) $-2p \times -6p$ [1]

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.....

3. Expand each of the following.

(a) $t(t - 4)$ [1]

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(b) $2y(3y + 7)$ [1]

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.....

(c) $-5a(a - 2b)$ [1]

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.....

4. Expand each of the following.

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

.....
.....

(b) $-(4 - y)$ [1]

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.....

5. Complete each of the following by writing the missing number or term in the space.

(a) $6(\text{.....} + 2) = 18x + 12$ [1]

(b) $2b(b - \text{.....}) = 2b^2 - 10b$ [1]

6. Expand and simplify each of the following.

(a) $3(2x + 5) + 2(x - 6)$

[2]

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(b) $5(y + 3) - 2(3y - 1)$

[2]

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7. Gethin expands and simplifies $(x + 5)(x - 2)$. He writes $x^2 - 10$.

Explain the mistake Gethin has made, and write down the correct answer.

[2]

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8. Expand and simplify each of the following.

(a) $(x + 8)(x + 3)$

[2]

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(b) $(n - 6)(n + 4)$

[2]

(c) $(a - 3)(a - 10)$

[2]

9. Expand and simplify each of the following.

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

[2]

(b) $(2y - 3)(3y - 2)$

[2]

- 10.** Expand and simplify $(2m - 1)^2$. **[2]**

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- 11.** Ffion says,

“For every positive value of x , $x(x + 3)$ is greater than $x^2 + 2x$.”

Is Ffion correct? You must show your working.

[2]

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- 12.** (a) Find the value of p such that $3(x + p) + 2(x - 1) \equiv 5x + 13$ **[2]**

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- (b) $(x + 3)(x + q) \equiv x^2 + 10x + r$

Find the value of q and the value of r .

[2]

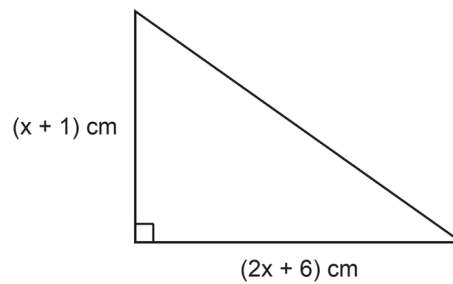
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- 13.** The diagram shows a right-angled triangle.



Show that the area of the triangle, in cm^2 , is $x^2 + 4x + 3$.

[3]

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- 14.** Show that $(2n + 1)^2 - (2n - 1)^2 \equiv 8n$.

[3]

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SECTION B

You may use a calculator in this section.

15. Expand and simplify each of the following.

(a) $1.5(4x - 2.6)$

[1]

(b) $(x + 0.7)(x + 1.3)$

[2]

16. A club buys 35 tickets for a trip. Each ticket costs $\pounds(t + 1.80)$.

The club is given a discount of $\pounds12.50$ on the total cost.

Find an expression, in pounds, for the amount the club pays. Give your answer in its simplest form.

[2]

END OF QUESTIONS

Mark scheme

Codes: M marks are for a correct method. A marks are for an accurate answer and depend on the M mark before them. B marks are independent of method. E marks are for an explanation. SC marks are for special cases. FT means follow through from an earlier answer, ISW ignore subsequent working, oe or equivalent, and CAO correct answer only.

For methods not covered by the mark scheme, give equivalent marks for equivalent correct work.

Section A: Non-calculator	Mark	Comment
1.(a) $3m + 21$	B1	oe, e.g. $21 + 3m$ Do not accept $3m + 7$.
1.(b) $18n - 9$	B1	oe, e.g. $-9 + 18n$ Do not accept $18n - 1$ or $18n + 9$.
1.(c) $-8w + 20$	B1	oe, e.g. $20 - 8w$ Do not accept $20 - 2w$ or $20 + 8w$.
	(3)	

Section A: Non-calculator	Mark	Comment
2.(a) $12a^2$	B1	CAO Do not accept $12a$, $7a^2$ or $12aa$.
2.(b) $10xy$	B1	CAO; accept $10yx$ Do not accept $7xy$ or $10x + y$.
2.(c) $12p^2$	B1	CAO Do not accept $-12p^2$, $12p$ or $-8p^2$.
	(3)	

Section A: Non-calculator	Mark	Comment
3.(a) $t^2 - 4t$	B1	oe, e.g. $-4t + t^2$ Do not accept $2t - 4t$, $-2t$ or $t^2 - 4$.
3.(b) $6y^2 + 14y$	B1	oe, e.g. $14y + 6y^2$ Do not accept $6y + 14y$, $5y^2 + 14y$ or $6y^2 + 7$.
3.(c) $-5a^2 + 10ab$	B1	oe, e.g. $10ab - 5a^2$; accept $10ba$ for $10ab$ Do not accept $-5a^2 - 10ab$ or $-5a^2 + 10b$.
	(3)	

Section A: Non-calculator	Mark	Comment
4.(a) $-6x - 15$	B1	oe, e.g. $-15 - 6x$ Do not accept $-6x + 15$ or $-6x + 5$.
4.(b) $y - 4$	B1	oe, e.g. $-4 + y$ Do not accept $-4 - y$ or $4 - y$.
	(2)	

Section A: Non-calculator	Mark	Comment
5.(a) $3x$	B1	CAO Do not accept 3, $18x$ or $12x$.
5.(b) 5	B1	CAO Do not accept 10, -5 or $5b$.
	(2)	

Section A: Non-calculator	Mark	Comment
6.(a) $6x + 15 + 2x - 12$	M1	at least three of the four terms correct
$8x + 3$	A1	oe, e.g. $3 + 8x$ A correct answer with no working scores 2 marks. $8x + 27$ (2×-6 taken as $+12$) scores M1 A0 if $6x + 15 + 2x$ is seen.
6.(b) $5y + 15 - 6y + 2$	M1	at least three of the four terms correct
$-y + 17$	A1	oe, e.g. $17 - y$ A correct answer with no working scores 2 marks. $-1y + 17$ scores M1 A0. $-y + 13$ (-2×-1 taken as -2) scores M1 A0 if $5y + 15 - 6y$ is seen.
	(4)	

Section A: Non-calculator	Mark	Comment
7. He has only multiplied the first terms and the last terms: he has missed out the middle terms, $-2x$ and $+5x$	E1	oe, e.g. "there should be four multiplications"
$x^2 + 3x - 10$	B1	CAO E1 needs a statement that the x terms (the middle terms, or the products $x \times -2$ and $5 \times x$) have been left out. Do not award E1 for "the answer is $x^2 + 3x - 10$ " on its own. B1 may be awarded without the E1.
	(2)	

Section A: Non-calculator	Mark	Comment
8.(a) $x^2 + 3x + 8x + 24$	M1	at least three of the four terms correct
$x^2 + 11x + 24$	A1	oe, terms in any order A correct answer with no working scores 2 marks. $x^2 + 24$ scores M0 A0.
8.(b) $n^2 + 4n - 6n - 24$	M1	at least three of the four terms correct
$n^2 - 2n - 24$	A1	oe, terms in any order A correct answer with no working scores 2 marks. $n^2 + 2n - 24$ or $n^2 - 2n + 24$ scores M1 A0 if three correct terms are seen.
8.(c) $a^2 - 10a - 3a + 30$	M1	at least three of the four terms correct
$a^2 - 13a + 30$	A1	oe, terms in any order A correct answer with no working scores 2 marks. $a^2 - 13a - 30$ scores M1 A0 if three correct terms are seen.
	(6)	

Section A: Non-calculator	Mark	Comment
9.(a) $5x^2 - 15x + 2x - 6$	M1	at least three of the four terms correct
$5x^2 - 13x - 6$	A1	oe, terms in any order A correct answer with no working scores 2 marks. $5x^2 + 13x - 6$ or $5x^2 - 17x - 6$ scores M1 A0 if three correct terms are seen.
9.(b) $6y^2 - 4y - 9y + 6$	M1	at least three of the four terms correct
$6y^2 - 13y + 6$	A1	oe, terms in any order A correct answer with no working scores 2 marks. $6y^2 - 13y - 6$ scores M1 A0 if three correct terms are seen. $5y^2 - 13y + 6$ scores M1 A0.
	(4)	

Section A: Non-calculator	Mark	Comment
10. $(2m - 1)(2m - 1)$ or $4m^2 - 2m - 2m + 1$	M1	oe
$4m^2 - 4m + 1$	A1	oe, terms in any order A correct answer with no working scores 2 marks. $4m^2 + 1$, $4m^2 - 1$ or $2m^2 - 4m + 1$ scores M0 A0.
	(2)	

Section A: Non-calculator	Mark	Comment
11. $x(x + 3) = x^2 + 3x$	M1	oe
Yes, because $x^2 + 3x - (x^2 + 2x) = x$, which is positive when x is positive	E1	oe, e.g. "3x is greater than 2x when x is positive" E1 needs "yes" with a comparison of the expanded forms, e.g. a difference of x, or $3x > 2x$ for positive x. Trying one or more values of x on their own scores M0 E0: that does not show it for every positive value. "Yes" with no working scores M0 E0.
	(2)	

Section A: Non-calculator	Mark	Comment
12.(a) $3x + 3p + 2x - 2$ or $3p - 2 = 13$	M1	oe
$p = 5$	A1	CAO $p = 5$ with no working scores 2 marks. $p = \frac{11}{3}$ (from $3p + 2 = 13$) scores M1 A0.
12.(b) $q = 7$	B1	CAO
$r = 21$	B1	FT $3 \times$ their q $x^2 + 3x + qx + 3q$ seen may help, but each value scores on its own.
	(4)	

Section A: Non-calculator	Mark	Comment
13. $\frac{1}{2} \times (2x + 6) \times (x + 1)$	M1	oe, e.g. $(2x + 6)(x + 1) \div 2$
$2x^2 + 2x + 6x + 6$ or $(x + 3)(x + 1) = x^2 + x + 3x + 3$	M1	at least three of the four terms correct
$\frac{1}{2}(2x^2 + 8x + 6) = x^2 + 4x + 3$	A1	fully correct working seen "Show that": the A1 needs the area formula, the expansion and the halving all seen, leading to $x^2 + 4x + 3$. $(2x + 6)(x + 1) = 2x^2 + 8x + 6$ with no halving scores M0 M1 A0.
	(3)	

Section A: Non-calculator	Mark	Comment
14. $(2n + 1)^2 = 4n^2 + 4n + 1$	M1	oe, e.g. $4n^2 + 2n + 2n + 1$
$(2n - 1)^2 = 4n^2 - 4n + 1$	M1	oe; or $-4n^2 + 4n - 1$ in the subtraction
$4n^2 + 4n + 1 - 4n^2 + 4n - 1 = 8n$	A1	fully correct working seen "Show that": the A1 needs both expansions and the subtraction seen, leading to $8n$. Do not award A1 if the second square has been subtracted as $-4n^2 - 4n + 1$. Checking one or more values of n on their own scores 0.
	(3)	

Section B: Calculator	Mark	Comment
15.(a) $6x - 3.9$	B1	oe, e.g. $-3.9 + 6x$ Do not accept $6x - 2.6$ or $6x + 3.9$.
15.(b) $x^2 + 1.3x + 0.7x + 0.91$	M1	at least three of the four terms correct
$x^2 + 2x + 0.91$	A1	oe, terms in any order A correct answer with no working scores 2 marks. $x^2 + 2x + 2$ or $x^2 + 0.91$ scores M0 A0.
	(3)	

Section B: Calculator	Mark	Comment
16. $35(t + 1.80) - 12.50$ or $35t + 63 - 12.50$	M1	oe
$35t + 50.5$	A1	oe, e.g. $50.5 + 35t$; accept $35t + 50.50$ A correct answer with no working scores 2 marks. $35t + 1.80 - 12.50$ (only t multiplied by 35) scores M0 A0.
	(2)	