

GCSE (9–1) MATHEMATICS

Expanding Brackets

Pearson Edexcel-style Topic Practice**Mixed Non-Calculator and Calculator Topic Practice**

Based on Pearson Edexcel GCSE Mathematics (1MA1)

Name _____

Date _____

Instructions

- Answer all questions.
- Write your answers in the spaces provided.
- You must show all your working.
- Section A: you must not use a calculator.
- Section B: you may use a calculator.

Information

- The marks for each question are shown in brackets.
- 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.
- The total mark for this paper is 48.

These are original practice questions written in the style of Pearson Edexcel GCSE Mathematics. They are not official Pearson examination questions.

Total marks

48

SECTION A

You must not use a calculator in this section.

1 Expand

(a) $5(m + 3)$

Answer

(1)

(b) $4(2y - 7)$

Answer

(1)

(c) $6(3 - 4k)$

Answer

(1)**(Total for Question 1 = 3 marks)****2** Simplify

(a) $2a \times 7b$

Answer

(1)

(b) $5p \times 3p$

Answer

(1)

(c) $3y \times -4y$

Answer

(1)**(Total for Question 2 = 3 marks)****3** Expand

(a) $x(x + 9)$

Answer

(1)

Question 3 continued

(b) $3t(2t - 5)$

Answer

(1)

(c) $2y(y^2 + 4y - 3)$

Answer

(2)

(Total for Question 3 = 4 marks)**4** Expand

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

Answer

(1)

(b) $-5(3p - 4)$

Answer

(1)

(c) $-(7 - 2c)$

Answer

(1)

(Total for Question 4 = 3 marks)**5** Expand and simplify

(a) $4(x + 3) + 2(x + 5)$

Answer

(2)

Question 5 continued

(b) $3(2y - 1) - 2(y + 4)$

Answer

(2)

(Total for Question 5 = 4 marks)

- 6 Ravi was asked to expand and simplify $7(x + 2) - 3(x - 4)$

Here is his working.

$$7x + 14 - 3x - 12 = 4x + 2$$

- (a) Explain the mistake Ravi has made.

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(1)

- (b) Expand and simplify $7(x + 2) - 3(x - 4)$

Answer

(1)

(Total for Question 6 = 2 marks)

- 7 Expand and simplify

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

Answer

(2)

Question 7 continued

(b) $(y - 6)(y + 2)$

Answer

(2)

(c) $(n - 4)(n - 7)$

Answer

(2)

(Total for Question 7 = 6 marks)

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

Answer

(2)

(Total for Question 8 = 2 marks)

9 Expand and simplify $(p - 3)^2$

Answer

(2)

(Total for Question 9 = 2 marks)

- 10** Amir says, " $(a + 4)^2 = a^2 + 16$ "

Is Amir correct? You must give a reason for your answer.

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(1)

(Total for Question 10 = 1 mark)

- 11** $(x + 6)(x + k) \equiv x^2 + 2x - 24$

Find the value of k.

Answer

(2)

(Total for Question 11 = 2 marks)

- 12** $a(3x + b) \equiv 12x - 20$

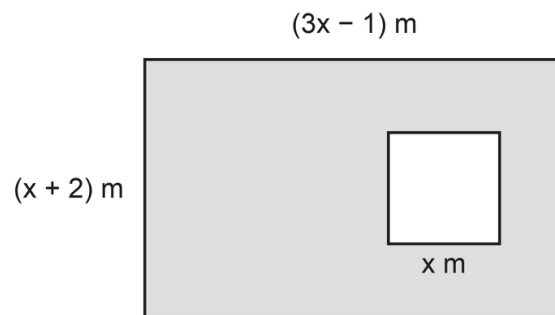
Find the value of a and the value of b.

Answer

(2)

(Total for Question 12 = 2 marks)

- 13 The diagram shows a rectangular garden with a square pond.



The shaded part of the garden is lawn.

Show that the area of the lawn, in m^2 , is $2x^2 + 5x - 2$

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(3)

(Total for Question 13 = 3 marks)

- 14 n is a whole number.

Show that the value of $(n + 3)(n + 2) - n(n + 5)$ is the same for every value of n .

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(3)

(Total for Question 14 = 3 marks)

SECTION B

You may use a calculator in this section.

15 Expand and simplify

(a) $2.5(4x - 1.6)$

Answer

(1)

(b) $(x + 1.5)(x - 0.4)$

Answer

(2)

(Total for Question 15 = 3 marks)

16 Pens cost $\pounds(p + 0.35)$ each.

Jo buys 12 pens. She pays with a £20 note.

Write an expression, in terms of p , for the change Jo should get, in pounds. Give your answer in its simplest form.

Answer

(3)

(Total for Question 16 = 3 marks)

- 17** A rectangular photograph is $(x + 3.5)$ cm long and $(x + 2.4)$ cm wide.

Write an expression, in terms of x , for the area of the photograph. Give your answer in its simplest form.

Answer cm^2

(2)

(Total for Question 17 = 2 marks)

TOTAL FOR PAPER = 48 MARKS

Mark scheme

General marking guidance: M marks are method marks for a correct method or partial method. P marks are process marks for a correct process within a problem-solving question. A marks are accuracy marks, normally dependent on the relevant M or P mark. B marks are unconditional accuracy marks: no method is required. C marks are communication marks for a fully correct statement or conclusion with no contradiction or ambiguity. oe means "or equivalent", cao "correct answer only" and ft "follow through".

Question number	Answer	Additional guidance	Mark
1(a)	$5m + 15$	B1 for $5m + 15$ oe, e.g. $15 + 5m$ Do not accept $5m + 3$	(1)
1(b)	$8y - 28$	B1 for $8y - 28$ oe, e.g. $-28 + 8y$ Do not accept $8y - 7$ or $8y + 28$	(1)
1(c)	$-24k + 18$	B1 for $-24k + 18$ oe, e.g. $18 - 24k$ Do not accept $18 - 4k$ or $18 + 24k$	(1)

(Total for Question 1 = 3 marks)

Question number	Answer	Additional guidance	Mark
2(a)	$14ab$	B1 cao Accept $14ba$ Do not accept $9ab$ or $2a7b$	(1)
2(b)	$15p^2$	B1 cao Do not accept $15p$, $8p^2$ or $15pp$	(1)
2(c)	$-12y^2$	B1 cao Do not accept $12y^2$, $-12y$ or $-y^2$	(1)

(Total for Question 2 = 3 marks)

Question number	Answer	Additional guidance	Mark
3(a)	$x^2 + 9x$	B1 for $x^2 + 9x$ oe, e.g. $9x + x^2$ Do not accept $2x + 9x$, $10x$ or $x^2 + 9$	(1)
3(b)	$6t^2 - 15t$	B1 for $6t^2 - 15t$ oe, e.g. $-15t + 6t^2$ Do not accept $6t - 15t$ or $6t^2 - 5$	(1)
3(c)	$2y^3 + 8y^2 - 6y$	B2 for $2y^3 + 8y^2 - 6y$ oe, with the terms in any order B1 for two of $2y^3$, $8y^2$, $-6y$ correct in an expression Do not award B2 for $2y^2 + 8y^2 - 6y$ or $2y^3 + 8y^2 - 3$	(2)

(Total for Question 3 = 4 marks)

Question number	Answer	Additional guidance	Mark
4(a)	$-2x - 12$	B1 for $-2x - 12$ oe, e.g. $-12 - 2x$ Do not accept $-2x + 12$ or $-2x + 6$	(1)
4(b)	$-15p + 20$	B1 for $-15p + 20$ oe, e.g. $20 - 15p$ Do not accept $-15p - 20$ or $-15p - 4$	(1)
4(c)	$2c - 7$	B1 for $2c - 7$ oe, e.g. $-7 + 2c$ Do not accept $-7 - 2c$ or $7 - 2c$	(1)

(Total for Question 4 = 3 marks)

Question number	Answer	Additional guidance	Mark
5(a)	$6x + 22$	M1 for at least three of the four terms 4x, 12, 2x, 10 correct, e.g. $4x + 12 + 2x + 10$ A1 for $6x + 22$ oe, e.g. $22 + 6x$ Do not award A1 for $6x + 15$ or $28x$	(2)
5(b)	$4y - 11$	M1 for at least three of the four terms 6y, -3, -2y, -8 correct, e.g. $6y - 3 - 2y - 8$ A1 for $4y - 11$ oe, e.g. $-11 + 4y$ Do not award A1 for $4y + 5$ or $4y - 7$	(2)

(Total for Question 5 = 4 marks)

Question number	Answer	Additional guidance	Mark
6(a)	He worked out -3×-4 as -12 . It should be $+12$, so the last term in his expansion should be $+12$.	C1 for identifying that the sign of the 12 is wrong, e.g. " $-3 \times -4 = +12$, not -12 " or "a negative times a negative is positive, so it should be $+12$ " Do not award C1 for "the answer should be $4x + 26$ " without a reason Do not award C1 for a comment about the x terms only	(1)
6(b)	$4x + 26$	B1 for $4x + 26$ oe, e.g. $26 + 4x$ Do not accept $4x + 2$ or $4x + 10$	(1)

(Total for Question 6 = 2 marks)

Question number	Answer	Additional guidance	Mark
7(a)	$x^2 + 8x + 15$	M1 for four correct terms ignoring signs, or three correct terms with correct signs, from x^2 , $3x$, $5x$, 15 A1 for $x^2 + 8x + 15$ oe, with the terms in any order Do not award A1 for $x^2 + 15$ or $x^2 + 8x + 8$	(2)
7(b)	$y^2 - 4y - 12$	M1 for four correct terms ignoring signs, or three correct terms with correct signs, from y^2 , $2y$, $-6y$, -12 A1 for $y^2 - 4y - 12$ oe, with the terms in any order Do not award A1 for $y^2 + 4y - 12$ or $y^2 - 12$	(2)
7(c)	$n^2 - 11n + 28$	M1 for four correct terms ignoring signs, or three correct terms with correct signs, from n^2 , $-7n$, $-4n$, 28 A1 for $n^2 - 11n + 28$ oe, with the terms in any order Do not award A1 for $n^2 - 11n - 28$ or $n^2 - 3n + 28$	(2)

(Total for Question 7 = 6 marks)

Question number	Answer	Additional guidance	Mark
8	$6x^2 + 7x - 20$	M1 for four correct terms ignoring signs, or three correct terms with correct signs, from $6x^2$, $-8x$, $15x$, -20 A1 for $6x^2 + 7x - 20$ oe, with the terms in any order Do not award A1 for $6x^2 - 20$, $6x^2 - 7x - 20$ or $5x^2 + 7x - 20$	(2)

(Total for Question 8 = 2 marks)

Question number	Answer	Additional guidance	Mark
9	$p^2 - 6p + 9$	M1 for $(p - 3)(p - 3)$ written, or for four correct terms ignoring signs, or three correct terms with correct signs, from p^2 , $-3p$, $-3p$, 9 A1 for $p^2 - 6p + 9$ oe, with the terms in any order Do not award M1 for $p^2 + 9$ or $p^2 - 9$ on their own	(2)

(Total for Question 9 = 2 marks)

Question number	Answer	Additional guidance	Mark
10	No. $(a + 4)^2 = (a + 4)(a + 4) = a^2 + 8a + 16$. Amir has missed out the $8a$. or No. When $a = 1$, $(a + 4)^2 = 25$ but $a^2 + 16 = 17$	C1 for "no" with a correct reason, e.g. a correct expansion of $(a + 4)^2$, "he has missed out the middle term $8a$ " or a correct counter-example with both values shown Do not award C1 for "no" on its own, or for "no, you have to expand the brackets" with no further detail Do not award C1 for a counter-example using $a = 0$, which gives 16 both times	(1)

(Total for Question 10 = 1 mark)

Question number	Answer	Additional guidance	Mark
11	$k = -4$	M1 for $6k = -24$ or $6 + k = 2$, or for $x^2 + kx + 6x + 6k$ oe A1 cao Do not award A1 for $k = 4$	(2)

(Total for Question 11 = 2 marks)

Question number	Answer	Additional guidance	Mark
12	$a = 4$ and $b = -5$	M1 for $3a = 12$ or $a = 4$ stated, or for $3ax + ab$ oe A1 for $a = 4$ and $b = -5$ Do not award A1 for $b = 5$ or $b = -20$	(2)

(Total for Question 12 = 2 marks)

Question number	Answer	Additional guidance	Mark
13	$(3x - 1)(x + 2) - x^2$ $= 3x^2 + 6x - x - 2 - x^2$ $= 2x^2 + 5x - 2$	M1 for $(3x - 1)(x + 2) - x^2$ oe, or area of garden – area of pond with one area correct M1 for at least three of the four terms $3x^2$, $6x$, $-x$, -2 correct A1 for fully correct working, with the expansion seen, leading to $2x^2 + 5x - 2$	(3)

(Total for Question 13 = 3 marks)

Question number	Answer	Additional guidance	Mark
14	$(n + 3)(n + 2) = n^2 + 5n + 6$ and $n(n + 5) = n^2 + 5n$ $n^2 + 5n + 6 - (n^2 + 5n) = 6$ The value is always 6, so it is the same for every value of n .	M1 for $n^2 + 2n + 3n + 6$ or $n^2 + 5n + 6$ M1 for $n^2 + 5n$, or for $-n^2 - 5n$ in a subtraction C1 for showing the expression simplifies to 6, with a conclusion that 6 does not depend on n (or "it is always 6") Do not award C1 for trying one or more values of n on their own: that does not show it for every value	(3)

(Total for Question 14 = 3 marks)

Question number	Answer	Additional guidance	Mark
15(a)	$10x - 4$	B1 for $10x - 4$ oe, e.g. $-4 + 10x$ Do not accept $10x - 1.6$ or $10x + 4$	(1)
15(b)	$x^2 + 1.1x - 0.6$	M1 for four correct terms ignoring signs, or three correct terms with correct signs, from x^2 , $-0.4x$, $1.5x$, -0.6 A1 for $x^2 + 1.1x - 0.6$ oe, with the terms in any order Do not award A1 for $x^2 + 1.9x - 0.6$ or $x^2 + 1.1x + 0.6$	(2)

(Total for Question 15 = 3 marks)

Question number	Answer	Additional guidance	Mark
16	$-12p + 15.8$	M1 for $12(p + 0.35)$ oe, or $12p + 4.2$ seen M1 for $20 - 12(p + 0.35)$ oe, or $20 - (12p + 4.2)$ oe A1 for $-12p + 15.8$ oe, e.g. $15.8 - 12p$ Do not award A1 for $15.8 + 12p$, $20 - 12p + 4.2$ or $24.2 - 12p$	(3)

(Total for Question 16 = 3 marks)

Question number	Answer	Additional guidance	Mark
17	$x^2 + 5.9x + 8.4$	M1 for $(x + 3.5)(x + 2.4)$ expanded with four correct terms ignoring signs, or three correct terms with correct signs, from x^2 , $2.4x$, $3.5x$, 8.4 A1 for $x^2 + 5.9x + 8.4$ oe, with the terms in any order Do not award A1 for $x^2 + 8.4$ or $x^2 + 5.9x$	(2)

(Total for Question 17 = 2 marks)