

GCSE MATHEMATICS

Collecting Like Terms

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 37.
- 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	
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 term that is like $5y^2$. [1 mark]

$5y$

$5x^2$

$-3y^2$

$2y^3$

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

$5a$

$4a^2$

$5a^2$

$4a + 1$

- (c) Simplify $6c - 9c$

Circle your answer.

[1 mark]

$3c$

$-3c$

$-15c$

-3

- 2** Simplify

- (a) $3h + 8h$ [1 mark]

Answer _____

- (b) $7r + r + 4r$ [1 mark]

Answer _____

- 3** Simplify

- (a) $4q + 7 + 3q + 2$ [1 mark]

Answer _____

- (b) $9 + 2f + 5 + 6f$ [1 mark]

Answer _____

- (c) $6m + n + 2m + 4n$ [1 mark]

Answer _____

4 Simplify

(a) $3g - 7g$

[1 mark]

Answer _____

(b) $8w - 3w - 4w$

[1 mark]

Answer _____

(c) $-2z + 5z - 4z$

[1 mark]

Answer _____

(d) $4v + 5v - 9v$

[1 mark]

Answer _____

5 Simplify

(a) $7d + 4 - 2d - 9$

[1 mark]

Answer _____

(b) $6s - 5t - 2s + 3t$

[2 marks]

Answer _____

5(c) $-3p + 8 + 5q + 7p - 8 - 6q$

[2 marks]

Answer _____

6 A student simplifies $9x - 4y - 2x + 6y$

Here is the student's working.

$$9x - 4y - 2x + 6y$$

$$= 9x + 2x - 4y + 6y$$

$$= 11x + 2y$$

Make one criticism of the student's working.

[1 mark]

7 Simplify

(a) $4n^2 + 3n^2$

[1 mark]

Answer _____

(b) $2a^2 + 5b^2 + a^2 - 3b^2$

[2 marks]

Answer _____

7(c) $6x^2 - x + 4 - 2x^2 + 5x - 7$

[2 marks]

Answer _____

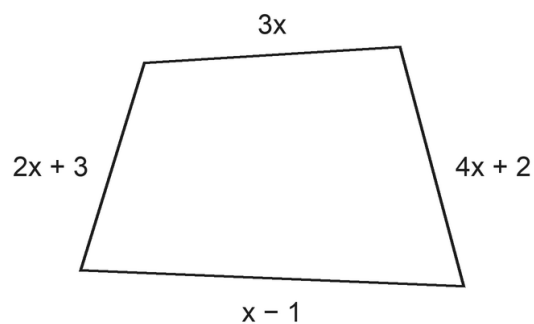
- 8** Jo says, " $3m^2 + 2m$ simplifies to $5m^3$."

Is Jo correct? Give a reason for your answer.

[1 mark]

- 9** Figure 1 shows a quadrilateral.

Figure 1



The lengths of the sides are in centimetres.

Write an expression, in terms of x , for the perimeter of the quadrilateral.

[2 marks]

Answer _____ cm

10 Simplify

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

[2 marks]

Answer _____

(b) $5xy - 2x + 3y - 4yx + 6x - 3y$

[2 marks]

Answer _____

11 Simplify fully $3x^2 + 2xy - 5 + x^2 - 7xy + 5 - 4x^2$ **[2 marks]**

Answer _____

SECTION B

You may use a calculator in this section.

12 Simplify

(a) $2.5c + 1.75c$

[1 mark]

Answer _____

(b) $4.8m - 1.2n - 3.3m + 0.5n$

[2 marks]

Answer _____

13 Simplify $0.6x^2 + 1.5x - 0.25x^2 - 2x$ **[2 marks]**

Answer _____

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 from an earlier answer, oe or equivalent, and cao correct answer only.

Q	Answer	Mark	Comments
1(a)	$-3y^2$	B1	
	Additional Guidance If more than one answer is circled, award no mark		
1(b)	5a	B1	
	Additional Guidance If more than one answer is circled, award no mark		
1(c)	$-3c$	B1	
	Additional Guidance If more than one answer is circled, award no mark		
Total		3	

Q	Answer	Mark	Comments
2(a)	11h	B1	
2(b)	12r	B1	do not accept 11r
Total		2	

Q	Answer	Mark	Comments
3(a)	$7q + 9$	B1	oe
3(b)	$8f + 14$	B1	oe
3(c)	$8m + 5n$	B1	oe; do not accept 13mn
Total		3	

Q	Answer	Mark	Comments
4(a)	$-4g$	B1	
4(b)	w	B1	do not accept 1w
4(c)	$-z$	B1	do not accept $-1z$
4(d)	0	B1	do not accept 0v
Total		4	

Q	Answer	Mark	Comments
5(a)	$5d - 5$	B1	oe
5(b)	$4s - 2t$	B2	oe; B1 for $4s$ or $-2t$ in an expression
5(c)	$4p - q$	B2	oe; B1 for $4p$ or $-q$ in an expression
Additional Guidance Do not award B2 for $4p - q + 0$ or $4p - 1q$			
Total		5	

Q	Answer	Mark	Comments
6	The $-2x$ has been changed to $+2x$	B1	oe
Additional Guidance - The criticism must refer to the sign of the $2x$ term, e.g. "it should be $9x - 2x$" or "$9x - 2x = 7x$, not $11x$" - Do not award for "the answer should be $7x + 2y$" on its own			
Total		1	

Q	Answer	Mark	Comments
7(a)	$7n^2$	B1	
7(b)	$3a^2 + 2b^2$	B2	oe; B1 for $3a^2$ or $2b^2$ in an expression
7(c)	$4x^2 + 4x - 3$	B2	oe, terms in any order; B1 for two of $4x^2$, $4x$, -3 in an expression
Total		5	

Q	Answer	Mark	Comments
8	No, and a correct reason	B1	e.g. m^2 and m are not like terms
Additional Guidance - Acceptable reasons include: m^2 and m are not like terms; the powers of m are different; $3m^2$ and $2m$ cannot be collected; adding the terms does not give $5m^3$ - The answer must state or clearly imply that Jo is incorrect - The reason must identify that m^2 and m are unlike terms or have different powers - Do not award the mark for "No" on its own - Do not accept a reason that incorrectly states that the coefficients cannot be added simply because they are different			
Total		1	

Q	Answer	Mark	Comments
9	$2x + 3 + 3x + 4x + 2 + x - 1$	M1	oe; all four sides added
	$10x + 4$	A1	oe
	Additional Guidance Correct answer implies M1		
Total		2	

Q	Answer	Mark	Comments
10(a)	$5ab + 3a$	B2	oe; B1 for $5ab$ or $3a$ in an expression
	Additional Guidance Accept $5ba$ for $5ab$		
10(b)	$xy + 4x$	B2	oe; B1 for xy or $4x$ in an expression
	Additional Guidance - Accept yx for xy - Do not award B2 for $1xy + 4x$ or $xy + 4x + 0y$		
Total		4	

Q	Answer	Mark	Comments
11	$-5xy$	B2	B1 for $-5xy$ in an expression
	Additional Guidance Do not award B2 if a zero term is left in the answer, e.g. $0x^2 - 5xy$		
Total		2	

Q	Answer	Mark	Comments
12(a)	$4.25c$	B1	
12(b)	$1.5m - 0.7n$	B2	oe; B1 for $1.5m$ or $-0.7n$ in an expression
Total		3	

Q	Answer	Mark	Comments
13	$0.35x^2 - 0.5x$	B2	oe; B1 for $0.35x^2$ or $-0.5x$ in an expression
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	34 marks (92%)
AO2 — reason, interpret and communicate mathematically	2 marks (5%)
AO3 — solve problems within mathematics and in other contexts	1 mark (3%)
Total	37 marks