



KS3.M-A5 Simplifying and Collecting Like Terms

AQA KS3.M-A5 · Calculators not allowed · about 50 minutes

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

1 Write down whether each pair of terms is like terms or not. State yes or no.

(a) $3x$ and $-7x$ (1)

(b) $5ab$ and $2ba$ (1)

(c) $4x^2$ and $-x$ (1)

(d) $7y$ and 7 (1)

2 Collect like terms and simplify each expression.

(a) Simplify $2x + 5x$ (1)

(b) Simplify $6y - 2y$ (1)

(c) Simplify $3a + 4b + 2a$ (1)

3 Simplify each single-term combination.

(a) Simplify $-2m + 7m$ (1)

(b) Simplify $4p - 9p$ (1)

(c) Simplify $0 + 6t$ (1)

4 Simplify each expression by collecting like terms. Show working.

(a) Simplify $8x + 3x - 5x$ (2)

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

5 Simplify the expressions and write the result in simplest form.

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

(b) Simplify $6y - 2 + y + 8$ (2)

6 Simplify each product by multiplying the coefficient only (variables stay as letters).

(a) Calculate $4 \times 3x$ (1)

(b) Calculate $-2 \times 5y$ (1)

7 Multiply out the brackets where the brackets contain a single term.

(a) Simplify $5(2x)$ (1)

(b) Simplify $-3(4y)$ (1)

(c) Simplify $2(-3a)$ (1)

8 Simplify the following by multiplying coefficients and keeping variables.

(a) Simplify $3 \times 2ab$ (1)

(b) Simplify $-1 \times 7xy$ (1)

9 Simplify each quotient by dividing the coefficient only. Keep variables unchanged.

(a) Simplify $(12x) \div 3$ (1)

(b) Simplify $(9y) \div 3$ (1)

(c) Simplify $(-6a) \div 2$ (1)

10 Simplify fully by collecting like terms and performing simple multiplications.

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

11 Expand and then simplify the expression where the bracket has two terms multiplied by a number.

(a) Simplify $3(x + 2)$ (2)

12 Simplify and collect like terms after expanding. Show your method.

(a) Simplify $2(x + 3) + x$ (2)

13 Collect like terms and simplify each expression with two different variables.

(a) Simplify $4x + 3y + 2x - y$ (3)

14 Simplify each expression that mixes multiplication and addition.

(a) Simplify $4(x + 1) + 2x$ (3)

15 Collect like terms and simplify. Some coefficients are negative.

(a) Simplify $-2x + 5x - 3 + 7$ (3)

16 Simplify and write in simplest form. Combine like terms and simplify products.

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

17 A small puzzle: simplify and then evaluate when $x = 2$.

(a) Simplify $2x + 3x - 4$ and then find its value when $x = 2$ (3)

18 Stretch question. Simplify fully, showing each step clearly.

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

Mark scheme · KS3.M-A5 Simplifying and Collecting Like Terms

Question 1

- (a) **B1** Yes, both have the same letter part x
- (a) Answer: **Yes**
- (b) **B1** Yes, ab and ba are the same product of variables
- (b) Answer: **Yes**
- (c) **B1** No, x^2 and x are different powers
- (c) Answer: **No**
- (d) **B1** No, one has variable y and the other is a constant
- (d) Answer: **No**

Question 2

- (a) **B1** 7x cao
- (a) Answer: **7x**
- (b) **B1** 4y cao
- (b) Answer: **4y**
- (c) **B1** $5a + 4b$ cao
- (c) Answer: **$5a + 4b$**

Question 3

- (a) **B1** 5m cao
- (a) Answer: **5m**
- (b) **B1** -5p cao
- (b) Answer: **-5p**
- (c) **B1** 6t cao
- (c) Answer: **6t**

Question 4

- (a) **M1** collecting like terms: $8x + 3x - 5x \rightarrow (8+3-5)x$
- (a) **A1** 6x cao
- (a) Answer: **6x**
- (b) **M1** grouping a terms and b terms: $2a+3a$ and $4b-b$
- (b) **A1** $5a + 3b$ cao
- (b) Answer: **$5a + 3b$**

Question 5

- (a) **M1** collect like x terms and constants
- (a) **A1** $2x + 7$ cao
- (a) Answer: **$2x + 7$**
- (b) **M1** collect like y terms and constants
- (b) **A1** $7y + 6$ cao
- (b) Answer: **$7y + 6$**

Question 6

- (a) **B1** 12x cao
- (a) Answer: **12x**
- (b) **B1** -10y cao
- (b) Answer: **-10y**

Question 7

- (a) **B1** $10x$ cao
- (a) Answer: **$10x$**
- (b) **B1** $-12y$ cao
- (b) Answer: **$-12y$**
- (c) **B1** $-6a$ cao
- (c) Answer: **$-6a$**

Question 8

- (a) **B1** $6ab$ cao
- (a) Answer: **$6ab$**
- (b) **B1** $-7xy$ cao
- (b) Answer: **$-7xy$**

Question 9

- (a) **B1** $4x$ cao
- (a) Answer: **$4x$**
- (b) **B1** $3y$ cao
- (b) Answer: **$3y$**
- (c) **B1** $-3a$ cao
- (c) Answer: **$-3a$**

Question 10

- (a) **M1** multiply inside brackets: $2(3x) \rightarrow 6x$
- (a) **M1** collect like terms: $6x + 4x \rightarrow (6+4)x$
- (a) **A1** $10x$ cao
- (a) Answer: **$10x$**

Question 11

- (a) **M1** multiply both terms by 3: $3x + 6$
- (a) **A1** $3x + 6$ cao
- (a) Answer: **$3x + 6$**

Question 12

- (a) **M1** expand $2(x+3) \rightarrow 2x + 6$ and then collect with $+x$
- (a) **A1** $3x + 6$ cao
- (a) Answer: **$3x + 6$**

Question 13

- (a) **M1** collect x terms: $4x + 2x$ and y terms: $3y - y$
- (a) **M1** compute: $6x$ and $2y$
- (a) **A1** $6x + 2y$ cao
- (a) Answer: **$6x + 2y$**

Question 14

- (a) **M1** expand $4(x+1) \rightarrow 4x + 4$
- (a) **M1** collect like terms $4x + 2x$
- (a) **A1** $6x + 4$ cao
- (a) Answer: **$6x + 4$**

Question 15

- (a) **M1** collect x terms and constant terms separately
- (a) **M1** compute $-2x + 5x = 3x$ and $-3 + 7 = 4$
- (a) **A1** $3x + 4$ cao
- (a) Answer: **$3x + 4$**

Question 16

- (a) **M1** expand both brackets: $2x+4$ and $3x-3$
- (a) **M1** collect like terms: $2x + 3x$ and $4 - 3$
- (a) **A1** $5x + 1$ cao
- (a) Answer: **$5x + 1$**

Question 17

- (a) **M1** collect like terms to get $5x - 4$
- (a) **M1** substitute $x = 2$ to get $5 \cdot 2 - 4$
- (a) **A1** 6 cao
- (a) Answer: **6**

Question 18

- (a) **M1** expand brackets: $3x+6$ and $-2x+2$
- (a) **M1** collect like x terms: $3x - 2x + x$
- (a) **A1** $2x + 8$ cao
- (a) Answer: **$2x + 8$**