MATHEMATICS · GRADES 7-9

Combining like terms

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you tidy up a long expression. Adding up all the hourly charges in a bill means grouping the matching parts together into one shorter total. It is the same as sorting a pile of coins into stacks before you count them, and it makes every algebra problem after it much easier to handle.



Rule

Only like terms can be combined.

Like terms have exactly the same variable part, including the same letters with the same powers. Add or subtract their coefficients — the numbers in front of the letters — and keep the variable part unchanged.

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Worked examples

EXAMPLE 1

Q Simplify 3x + 5x

SOLUTION

Picture it

Simplify 3x + 5x

Work it one step at a time, top to bottom.

Like terms have the same variable part: both are x terms.

Add their coefficients: 3 + 5 = 8

So 3x + 5x = 8x

EXAMPLE 2

Q Simplify 4a + 2b – a

SOLUTION

Picture it

Simplify 4a + 2b – a

Work it one step at a time, top to bottom.

Pick out the like terms: 4a and –a are both a terms; 2b stays alone.

Combine the a terms: 4 – 1 = 3, so 3a

So the simplified form is 3a + 2b.

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Practice questions

1 Simplify $2x + 7x$

- A 14x
- B 9x
- C 5x
- D 2x

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2 Simplify $5y - 2y$

- A 7y
- B 2y
- C 3y
- D 5y

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3 Collect the like terms in $3a + 4b + 2a$.

A 9ab

B 5a + 6b

C 3a + 4b

D 5a + 4b

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4 Work out $6m - m$ in its simplest form.

A 6m

B 5m

C 7m

D m

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5 Work out $x + x + x$ in its simplest form.

- A $3x$
- B x^3
- C 3
- D x

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6 Combine the like terms to simplify $4p + 3 - 2p$.

- A $6p + 3$
- B $2p - 3$
- C $2p + 3$
- D $4p + 3$

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7 What is $2x + 5 + 3x - 1$ in simplest form?

- **A** $5x + 6$
- **B** $5x - 4$
- **C** $6x + 4$
- **D** $5x + 4$

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8 Write $7a - 3a + 2b$ as simply as you can.

- **A** $6a + 2b$
- **B** $4a + 2b$
- **C** $4a - 2b$
- **D** $9ab$

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9 Work out -2x + 6x.

A -4x

B 8x

C 4x

D 2x

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10 Combine the like terms in 9t - 4t - t.

A 4t

B 5t

C 6t

D 14t

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ANSWER KEY

1. 9x

2. 3y

3. 5a + 4b

4. 5m

5. 3x

6. 2p + 3

7. 5x + 4

8. 4a + 2b

9. 4x

10. 4t

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