MATHEMATICS · GRADES 7-9

Adding polynomials

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you combine two totals that each depend on the same unknown into one simple total. A job that charges by the hour plus a job that charges by the hour is really one hourly total, not two separate bills. Adding polynomials does that combining for you, so you end up with one tidy expression instead of a pile of separate terms.



Rule

Adding polynomials: combine like terms.

Add the coefficients of terms that have the same variable raised to the same power, and leave unlike terms alone.

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Worked examples

EXAMPLE 1

Q Add $(3x^2 + 2x + 1) + (x^2 + 4x + 5)$

SOLUTION

Picture it

Add $(3x^2 + 2x + 1) + (x^2 + 4x + 5)$

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

Drop the brackets: $3x^2 + 2x + 1 + x^2 + 4x + 5$

Combine like terms: x^2 terms $3 + 1 = 4$, x terms $2 + 4 = 6$, constants $1 + 5 = 6$

So the sum is $4x^2 + 6x + 6$

EXAMPLE 2

Q Add $(2x + 3) + (5x - 1)$

SOLUTION

Picture it

Add $(2x + 3) + (5x - 1)$

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

Drop the brackets: $2x + 3 + 5x - 1$

Combine like terms: x terms $2 + 5 = 7$, constants $3 - 1 = 2$

So the sum is $7x + 2$

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Practice questions

1 Add $(x + 2) + (3x + 4)$

- **A** $4x + 2$
- **B** $4x + 6$
- **C** $3x + 6$
- **D** $4x - 6$

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2 Add $(2x^2 + 1) + (x^2 + 3)$

- **A** $2x^2 + 4$
- **B** $3x^2 + 2$
- **C** $3x^2 + 4$
- **D** $x^2 + 4$

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3 Add $(x + 1) + (2x + 3) + (x + 2)$.

- **A** $4x + 6$
- **B** $3x + 6$
- **C** $4x + 5$
- **D** $3x + 5$

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4 Add $(x + y) + (2x - y)$.

- **A** $3x$
- **B** $3x + 2y$
- **C** x
- **D** $3y$

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5 Add $(4x^2) + (3x^2)$.

- **A** $7x^2$
- **B** $7x$
- **C** $12x^2$
- **D** x^2

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6 Add $(3m^2 + 2m)$ and $(m^2 + 5)$. Give the answer in simplest form.

- **A** $4m^2 + 2m + 5$
- **B** $3m^2 + 2m + 5$
- **C** $4m^2 + 5$
- **D** $4m^2 + 2m + 3$

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7 Add $(2a^2 + 3a + 1) + (a^2 + a + 4)$.

- **A** $3a^2 + 4a + 5$
- **B** $3a^2 + 4a + 4$
- **C** $2a^2 + 4a + 5$
- **D** $3a^2 + 3a + 5$

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8 Add $(3x^3 + x) + (2x^3 + 4x)$.

- **A** $5x^3 + 5x$
- **B** $5x^3 + 4x$
- **C** $3x^3 + 5x$
- **D** $5x^3 + x$

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9 Which term is unlike the others?

- **A** $3x^2$
- **B** $5x$
- **C** $2x^2$
- **D** $7x^2$

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10 Add the polynomials $(x^2 - 3x + 2)$ and $(2x^2 + 3x - 2)$.

- **A** $2x^2$
- **B** x^2
- **C** $4x^2$
- **D** $3x^2$

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ANSWER KEY

1. $4x + 6$

2. $3x^2 + 4$

3. $4x + 6$

4. $3x$

5. $7x^2$

6. $4m^2 + 2m + 5$

7. $3a^2 + 4a + 5$

8. $5x^3 + 5x$

9. $5x$

10. $3x^2$

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