

Boost Free Lessons - Year 8 Maths

Lesson 4: Adding and Subtracting Like Terms

Name: _____ Grade: _____ Date: _____

Worked Example 1

Simplify $7a + 4b - 3a + 2b$

$$(7a - 3a) + (4b + 2b)$$

a terms (solid): $7a - 3a = 4a$

b terms (dashed): $4b + 2b = 6b$

1. Circle each group of like terms, and always take the sign that sits on the **left** of the term with it.
2. The a terms are $7a$ and $-3a$. The b terms are $+4b$ and $+2b$.
3. Evaluate each circle on its own: $7a - 3a = 4a$, and $4b + 2b = 6b$.
4. a terms and b terms are unlike, so they cannot be combined any further.

$$= 4a + 6b$$

Worked Example 2

Simplify $5x^2 + 3x - 2x^2 + x$

1. x^2 and x are **not** like terms. The power has to match as well as the letter.
2. Group the x^2 terms: $5x^2 - 2x^2 = 3x^2$.
3. Group the x terms: $3x + x = 4x$.

$$= 3x^2 + 4x$$

Remember: Like terms must have exactly the same variable **and** the same power. $3x$ and $3x^2$ are not like terms.



Question 1: Simplify the following.

1. $6m + 4m$

2. $9k - 2k$

3. $3a + 5a - 4a$

4. $8p - 8p$

5. $5x + 3y + 2x$

6. $7c - 2d + 4d$

7. $10n + 3 - 4n$

8. $2u + 9v - 5u$

9. $4g + 7h - g - 3h$

10. $12 - 5w + 3 + 8w$



Question 2: Simplify the following.

1. $3x^2 + 5x^2$

2. $7y^2 - 2y^2$

3. $4a^2 + 3a - a^2$

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

5. $9t - 4t^2 + t$

6. $2p^2 + 3p^2 - p$

7. $5k^2 - 8k^2$

8. $x^2 + x + x^2 + x$



Question 3: Answer the following questions.

1. Write and simplify an expression for the perimeter of a rectangle with length $3x$ and width $2x$.
2. A triangle has sides of $2a$, $3a$ and $4a$. Write and simplify an expression for its perimeter.
3. Simplify $4m + 3n - 2m + 5n - n$.
4. Explain why $3x + 3x^2$ cannot be simplified any further.
5. A rectangle has length $5y$ and width $y + 2$. Write and simplify an expression for its perimeter.





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Answers: Adding and Subtracting Like Terms

Question 1

- | | |
|--------------|---------------|
| 1. $10m$ | 6. $7c + 2d$ |
| 2. $7k$ | 7. $6n + 3$ |
| 3. $4a$ | 8. $-3u + 9v$ |
| 4. 0 | 9. $3g + 4h$ |
| 5. $7x + 3y$ | 10. $15 + 3w$ |

Question 2

- | | |
|----------------|------------------|
| 1. $8x^2$ | 5. $-4t^2 + 10t$ |
| 2. $5y^2$ | 6. $5p^2 - p$ |
| 3. $3a^2 + 3a$ | 7. $-3k^2$ |
| 4. $7m^2 - 3m$ | 8. $2x^2 + 2x$ |

Question 3

1. $10x$
2. $9a$
3. $2m + 7n$
4. The powers are different, so they are unlike terms and cannot be added.
5. $12y + 4$

