

Name _____ Date _____

Notes Combining Like Terms

One way to simplify an expression is to "combine like terms."

<p>What does it mean to combine like terms?</p>	
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You can only combine terms that have the same _____ and the same _____.

<p><i>To combine like terms, first use the commutative property to move all like terms together. Then, combine the coefficients of the variables.</i></p>		
<p style="text-align: center;"><i>Example 1:</i></p> $\begin{array}{c} \boxed{2a} + \boxed{3b} - \boxed{4a} \\ \downarrow \quad \downarrow \quad \downarrow \\ 2a - 4a + 3b \\ \underbrace{\hspace{2em}} \\ -2a + 3b \end{array}$	<div style="border: 1px solid black; padding: 5px; margin: 5px auto; width: fit-content;"> <p style="text-align: center;">Note: Make sure to move any negative signs with the term it is before!</p> </div> <p style="text-align: center;"><i>Example 1:</i></p> $\boxed{14m} - \boxed{3n^2} - \boxed{2n^2} + \boxed{3m}$	<p style="text-align: center;"><i>Example 1:</i></p> $5x + 4x - 6 + 5x^2$

Note: all of your answers should be arranged so that the variables are in _____ order first, then in order from greatest to least _____.

<p>Watch out for the following common mistakes! Circle the mistakes below:</p>		
<p style="text-align: center;"><i>Mistake #1:</i></p> $\boxed{a^2} - 4a + \boxed{5a}$ $\underbrace{\hspace{2em}} \\ 2a^2$ <p style="text-align: center;">You can ONLY combine terms when the variable has the same exponent.</p>	<p style="text-align: center;"><i>Mistake #2:</i></p> $\boxed{3y} + \boxed{4x^2} - \boxed{3y} + \boxed{5y}$ $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ 3y - y + 5y + 4x^2 \\ \underbrace{\hspace{2em}} \\ 7y + 4x^2$ <p style="text-align: center;">You should ALWAYS put the variables of your answer in alphabetical order, then in order by exponent.</p>	<p style="text-align: center;"><i>Mistake #3:</i></p> $\boxed{3h} + \boxed{14g} - \boxed{5h} + \boxed{5g}$ $\downarrow \quad \downarrow \quad \downarrow \quad \downarrow \\ 3h + 5h + 14g - 5g \\ \underbrace{\hspace{2em}} \quad \underbrace{\hspace{2em}} \\ 8h + 9g \\ \downarrow \quad \downarrow \\ 9g + 8h$ <p style="text-align: center;">You should ALWAYS move the negative sign along with the term that is after it.</p>

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Practice Combining Like Terms

Which terms are like terms? (Not all terms will be used.)

A) Choose all terms that can be combined with $3a$.	B) Choose all terms that can be combined with $4b$.	C) Choose all terms that can be combined with a^2 .	D) Choose all terms that can be combined with 5 .
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1. $14a$

2. $5ab$

3. $3b$

4. $3a^2$

5. $4b^2$

6. 17

7. 100

8. $14ab$

9. $5a^3$

10. $4a$

11. $16b$

12. $73a^2$

Simplify the following expressions by combining like terms. Show all work on a separate sheet of paper and box your answer.

13. $4x - 6x$

14. $7y + 5y - 5y$

15. $4r + 4y - 8$

16. $3m + 4n - 6n$

17. $4g + 6g - 3g$

18. $15f - 5 + 2f$

19. $13x - 7y + 4x$

20. $5x^2 - 4x + 9x^2$

21. $4b + 7a - 8$

22. $13r + 5s - 2r$

23. $a + a + 3b + b$

24. $3y - 4y^2 + 3y$

25. $(3a - b) + 2a$

26. $2w + 4w^2 - 5w^3$

27. $c^3 + 4c - 4c^3$

28. $a - 3b + 5c + 4a$

29. $2x + 7x - 6x + 8$

30. $11q + 5p - 9q + 7p$

31. $3mn + 4m - 2mn$

32. $0t - 9t + 6u + 4u^5$

33. $11d + 5f - 21d + 5 - 8$

34. $12 + 9x - 6x - 19$

35. $y^2 + 3y^2 - 6y + 4y^2$

36. $2 - 5t + 8 + 5t - 8$

When part of an expression is over or under a division bar, you must act as if that part of the expression is inside of parenthesis. Use PEMDAS to decide if you can simplify the expression any further. (Think: did you get a fraction that you can simplify?)

37. $\frac{14r + 12s}{4s - 10s}$

38. $\frac{3x^2}{12 - 14x^2}$

39. $\frac{2 - 5t}{2 + 5t - 4t}$

40. $\frac{2x - 6y + 4x}{3y - 8 + y}$

41. $\frac{11d + 9d}{8d - 3d}$

42. $\frac{12x - 7x}{5x}$

Bonus: Simplify the expression below by combining like terms.

$$4z + x - 5x + 7y - 3x + 5y^2 - 3z + 16z + 14x - 5$$