

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 _____.

*To combine like terms, **first** use the commutative property to move all like terms together. **Then**, combine the coefficients of the variables.*

<p style="text-align: center;"><i>Example 1:</i></p> $\begin{array}{c} \boxed{2a} + \boxed{3b} - \boxed{4a} \\ \downarrow \quad \downarrow \quad \downarrow \\ 2a - 4a + 3b \\ \underbrace{\hspace{2em}} \\ -2a + 3b \end{array}$	<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> $5x + 4x - 6 + 5x^2$
<p>Note: Make sure to move any negative signs with the term it is before!</p>		

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.)

<i>Circle all terms that can be combined with 3a.</i>	<i>Draw a square around all terms that can be combined with 4b.</i>	<i>Underline all terms that can be combined with a².</i>	<i>Draw an X through all terms that can be combined with 5.</i>
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1. 14a

2. 5ab

3. 3b

4. 3a²

5. 4b²

6. 17

7. 100

8. 14ab

9. 5a³

10. 4a

11. 16b

12. 73a²

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. 5x² – 4x + 9x²

21. 4b + 7a – 8

22. 13r + 5s – 2r

23. a + a + 3b + b

24. 3y – 4y² + 3y

25. (3a – b) + 2a

26. 2w + 4w² – 5w³

27. c³ + 4c – 4c³

28. a – 3b + 5c + 4a

29. 2x + 7x – 6x + 8

30. 11q + 5p – 9q + 7p

31. 3mn + 4m – 2mn

32. 0t – 9t + 6u + 4u⁵

33. 11d + 5f – 21d + 5 – 8

34. 12 + 9x – 6x – 19

35. y² + 3y² – 6y + 4y²

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.

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