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- I. Model Problems.
- II. Practice
- III. Challenge Problems
- IV. Answer Key

Web Resources



How to combine like terms: (Video Tutorial)

www.mathwarehouse.com/algebra/like-terms/how-to-combine-like-terms-in-math.php

Like Terms Games :

www.mathwarehouse.com/games/maths-games-online.php

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Graph Paper Maker (free): www.mathworksheetsgo.com/paper/

Math Games online (including like terms): www.mathwarehouse.com/games/maths-games-online.php

Combining Like Terms

Terms that contain the same variable or variables with the same exponents are like terms. To combine like terms, add the coefficients.

I. Model Problems

In these examples you will combine like terms.

Example 1: Simplify $5a^3 - 6a + 7a^2 - 8a^3 - 3a + 5a^2 - 12 + 11a + 4$.

First change subtraction to add the opposite.
 $5a^3 + (-6a) + 7a^2 + (-8a^3) + (-3a) + 5a^2 - 12 + 11a + 4$

Next group like terms.
 $5a^3 + (-8a^3) + 7a^2 + 5a^2 + (-3a) + (-6a) + 11a - 12 + 4$

Add the coefficients of the like terms.
 $-3a^3 + 12a^2 + 2a - 8$

Answer: $-3a^3 + 12a^2 + 2a - 8$

Example 2: Simplify $3x^2y - 16xy + 5xy^2 + 2x^2y - 13xy + 4xy^2 + 2xy + 11xy^2 + x^3y$.

First change subtraction to add the opposite:

$$3x^2y + (-16xy) + 5xy^2 + 2x^2y + (-13xy) + 4xy^2 + 2xy + 11xy^2 + x^3y$$

Next group like terms:

$$x^3y + [3x^2y + 2x^2y] + [5xy^2 + 4xy^2 + 11xy^2] + [(-16xy) + (-13xy) + 2xy]$$

Add the coefficients of the like terms.
 $x^3y + 5x^2y + 20xy^2 + -27xy$

Answer: $x^3y + 5x^2y + 20xy^2 + -27xy$

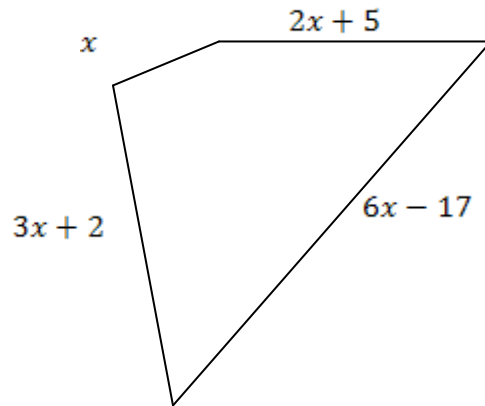
II. Practice

Simplify

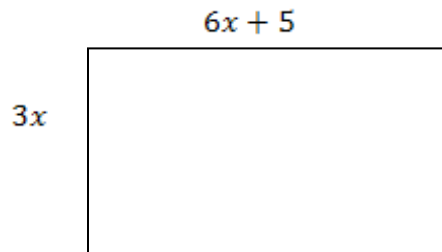
- $3a + 4a$
- $-12b + 6b - 4b$
- $5a^2 - 6a + 7a^2 + 3a - 2 + 8a + 7$
- $9x^3 - 7x^2 + 4x^2 - x + 4x^3 - 3x^2$
- $2h^2 - 7h + 2h^2 - h + 6 + 4h - 9h$
- $4ab - 6ab + 3a^2b + 4ab^2 + 5a^2b$
- $7xy - 4x^2y^2 + 2xy^2 + 6xy + 3x^2y^2 - 7x^2y^2$
- $4h^4j - 14h^3j^2 + 16h^2j^2 + 13h^4j + 15h^3j^2 - 17h^4j$
- $8x^3y^2 - 7x^2y + 8x + 4 - 6x^3y^2 + 2x^2y + 4x^2y - 3x + 5$
- $3r^3t + 5rt^2 - 6rt + 5 + 4rt - 3 + 6rt^2$
- $8x^4 - 7x^3 + 4x^4 + 2y^3 - 7xy + 3y^3 + 12xy$
- $3a^3b + 4a^2b^2 - 7a^3b + 2ab - 5a^2b^2 + 10a^3b$
- $5y^5 + 4y^4 + 3y^3 - 6y^2 + 8 - 7y^3 + 11 - 6y^3$
- $10c^2d^2 + 6cd^3 - 3c^2d + 5c^2d^2 - 4cd^3 + 3c^2d^2$
- $4x^3 + 3x^2y + 2xy^2 - 6y^3 + 5x^3 - 25y^3 + 3xy^2$
- $(3x^2 + 2xy + 4y^2) + (6x^2 - 5xy + 3y^2) + (9x^2 - 25y^2)$
- $(4a^3 + 7a^2b + 6b^3) + (a^3 + 2a^2b + 4b^3)$
- $(2x^2 - 3x + 6) + (5x^2 - 9x + 4) + (8x^2 + 12x)$
- $(3x^2 - 4x + 7) + (3x - 3x^2) + (x - 7)$
- $(12ab^2 - 7a^2b) + (3ab + 4a^2b + 6ab^2)$

IV. Challenge Problems

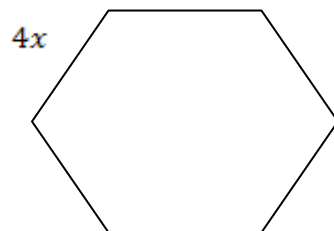
21. Write an expression for the perimeter of the figure below.



22. Write an expression for the perimeter of the rectangle below.



23. Write an expression for the perimeter of the regular hexagon below.



24. Write the expression for the perimeter of a rectangle with a length that is 5 inches longer than its width.

25. Write the expression for the perimeter of a rectangle with a length that is 4 centimeters longer than three times its width.

IV. Answer Key

1. $7a$
2. $-10b$
3. $12a^2 + 5a + 5$
4. $13x^3 - x$
5. $4h^2 - 13h + 6$
6. $8a^2b + 4ab^2 - 2ab$
7. $-8x^2y^2 + 2xy^2 + 13xy$
8. $h^3j^2 + 16h^2j^2$
9. $2x^3y^2 - x^2y + 5x + 9$
10. $3r^3t + 11rt^2 - 2rt + 2$
11. $12x^4 - 7x^3 + 4xy + 5y^3$
12. $6a^3b - a^2b^2 + 2ab$
13. $5y^5 + 4y^4 - 10y^3 - 6y^2 + 19$
14. $18c^2d^2 + 2cd^3 - 3c^2d$
15. $9x^3 + 3x^2y + 5xy^2 - 31y^3$
16. $18x^2 - 3xy - 18y^2$
17. $5a^3 + 9a^2b + 10b^3$
18. $15x^2 + 10$
19. 0
20. $18ab^2 - 3a^2b + 3ab$
21. $12x - 10$
22. $18x + 10$
23. $24x$
24. $4w + 10$ in
25. $8w + 8$ cm