Collecting Like Terms

Simplify the following expressions by collecting like terms.

---

1. Simplify: $a + a + a + a$

---

2. Simplify: $5x + 3x$

---

3. Simplify: $9y - 2y$

---

4. Simplify: $8p + p - 4p$

---

5. Simplify: $3x + 2y + 5x + 4y$

6. Simplify: $10a + 8b - 2a + 3b$

7. Simplify: $7c - 4d + c - 3d$

8. Simplify: $5x + 6 + 3x + 4$

9. Simplify: $8y + 5 - 2y - 1$

10. Simplify: $4a - 2b + 7 - a + 5b - 3$

Remember, x and x^2 are not like terms. Similarly, xy is different from x and y.

11. Simplify: $4x^2 + 3x + 2x^2 + 5x$

12. Simplify: $y^2 - 5y + 3y^2 + 8y$

13. Simplify: $8a^2 + 3a - 10 - 2a^2 + 5a - 1$

14. Simplify: $p^3 + 4p^2 - 5p + 2p^3 - p^2$

15. Simplify: $7xy + 5x + 3xy - 2x$

16. Simplify: $10ab - 4a + 2b - 6ab + a$

17. Simplify: $3x^2y + 5xy^2 + 8x^2y - 2xy^2$

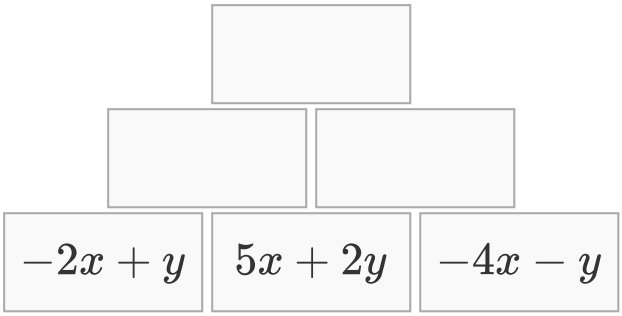
18. Simplify: $p^2q + pq + 4p^2q - 3pq$

19. Simplify: $6m^2n - 2mn^2 + mn + 3m^2n$

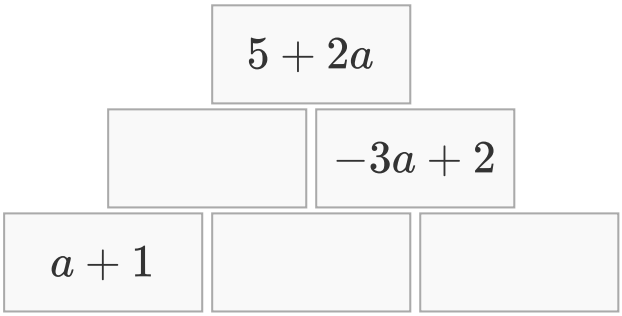
20. Simplify: $x^2 + 2xy + y^2 - 4x^2 + 3xy - 5y^2$

Number Pyramids: In these pyramids, each block is the sum of the two blocks directly beneath it. Fill in the missing expressions.

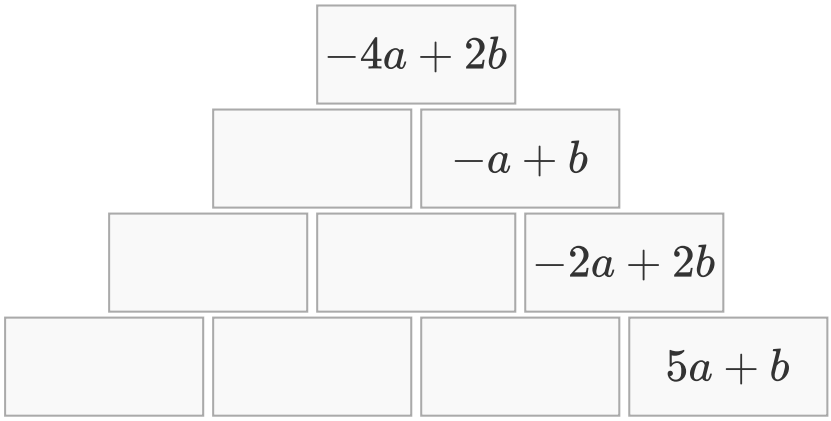
(a)



(b)

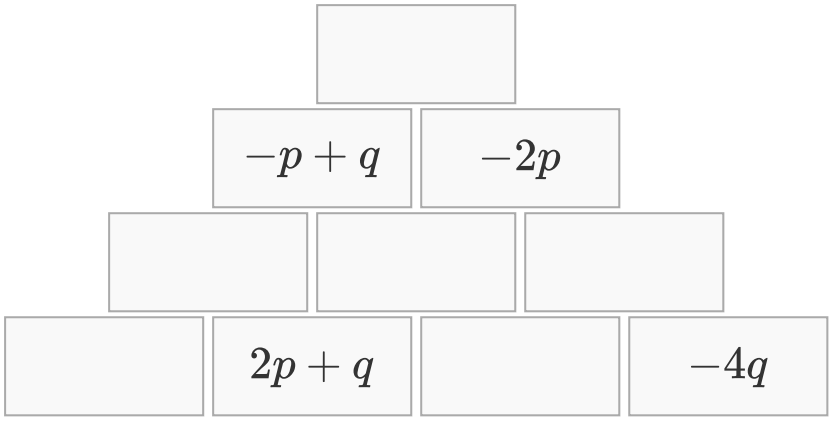


(c)

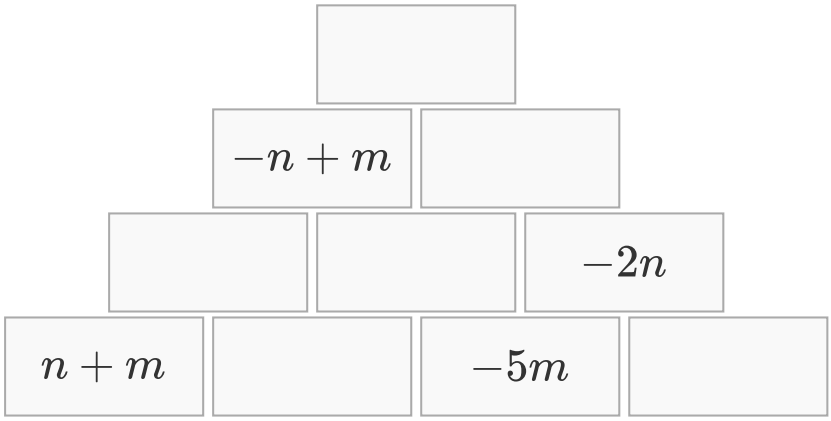


Challenge: In these pyramids, each block is the sum of the two blocks directly beneath it. Fill in the missing expressions.

(d)



(e)



Magic Square: In a magic square, the sum of each row, column, and diagonal have the same simplified expression. Find the magic expression and fill in the missing expressions.

(a)

	$3x + 6y$	
	$2x + 3y$	x
		$4x + 4y$

Challenge questions. Remember that ab is the same as ba.

21. Simplify: $5x - 3y + 2z + 4x - 8y - 5z$

22. Simplify: $a^2 + 2ab - b^2 - 3a^2 + 5ab + 4b^2$

23. Simplify: $10x^2y - 5xy + 3x - 4x^2y + 2xy - 7 + x$

24. Simplify: $4pq + 7qp$

25. Simplify: $8x^2y + 3yx^2$

26. Simplify: $cd + de + ec + dc$

27. Simplify: $5a^2b - 2ab^2 + 3ba^2 + 4b^2a$

28. The perimeter of the triangle below is $12x + 7y$. Find an expression for the missing side.
$A = 4x + y$, $B = 3x + 5y$

29. Find an expression for the perimeter of the shape below.
Sides: $3a + b, a, 2b, 5a - b, a + b$

30. Simplify: $k - (2k - 3m) + 4(k + m)$