# Simplifying Polynomials

| Name: _____ | Date: _____ | Score: _____ / 18 |
|---|---|---|

## Quick Review and Helpful Hints

To simplify a polynomial, first remove parentheses: distribute any coefficient, and remember that a *minus sign* in front of parentheses flips the sign of every term inside. Then combine like terms and write the result in descending order of degree.

▷ **Example:** Simplify $(3x^2 + 2x) - (x^2 - 4x)$. **Work:** Distribute the minus sign across the second group: $3x^2 + 2x - x^2 + 4x$. Now combine like terms: $(3x^2 - x^2) + (2x + 4x)$. ★ **Answer:** $2x^2 + 6x$

## Practice Problems

*Simplify each polynomial expression.*

**1.** $(2x + 3) + (5x - 1)$ _____

**2.** $(4a - 2) + (a + 6)$ _____

**3.** $(3x^2 + x) - (x^2 - 2x)$ _____

**4.** $(6y - 4) - (2y - 9)$ _____

**5.** $2(x + 4) + 3(x - 1)$ _____

**6.** $(5m^2 - 3m) + (2m^2 + m)$ _____

**7.** $(7 - 2x) - (3 - 5x)$ _____

**8.** $4(2a - 1) - (a + 3)$ _____

**9.** $(x^2 + 5x - 2) + (3x^2 - 2x + 6)$ _____

**10.** $(8b + 1) - (b - 7)$ _____

**11.** $3(x^2 - 2) + 2(x^2 + 5)$ _____

**12.** $(9p - 4) - (4p - 4)$ _____

**13.** $(2x^2 - x + 3) - (x^2 + 4x - 1)$ _____

**14.** $5(y + 2) - 2(2y - 3)$ _____

## Word Problems

**15.** A triangle has sides of length $x + 2$, $2x - 1$, and $3x + 4$. Write its perimeter in simplest form. _____

**16.** A company's revenue is $(5x^2 + 3x)$ and its cost is $(2x^2 - x)$. Revenue minus cost gives profit. Simplify the profit. _____

**17.** Add the polynomials $(4x^2 - 2x + 7)$ and $(x^2 + 6x - 3)$. _____

**18.** Subtract $(3a - 5)$ from $(7a + 2)$. _____

# Answer Keys

| | | |
|---|---|---|
| **1.** $\boxed{7x+2}$ | **7.** $\boxed{3x+4}$ | **13.** $\boxed{x^2-5x+4}$ |
| **2.** $\boxed{5a+4}$ | **8.** $\boxed{7a-7}$ | **14.** $\boxed{y+16}$ |
| **3.** $\boxed{2x^2+3x}$ | **9.** $\boxed{4x^2+3x+4}$ | **15.** $\boxed{6x+5}$ |
| **4.** $\boxed{4y+5}$ | **10.** $\boxed{7b+8}$ | **16.** $\boxed{3x^2+4x}$ |
| **5.** $\boxed{5x+5}$ | **11.** $\boxed{5x^2+4}$ | **17.** $\boxed{5x^2+4x+4}$ |
| **6.** $\boxed{7m^2-2m}$ | **12.** $\boxed{5p}$ | **18.** $\boxed{4a+7}$ |

## Step-by-Step Explanations

**1.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Combine like terms: $(2x+5x)+(3-1)=7x+2$. So the final answer is $7x+2$.

**2.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Combine: $(4a+a)+(-2+6)=5a+4$. So the final answer is $5a+4$.

**3.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the minus: $3x^2+x-x^2+2x=2x^2+3x$. So the final answer is $2x^2+3x$.

**4.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the minus: $6y-4-2y+9=4y+5$. So the final answer is $4y+5$.

**5.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute: $2x+8+3x-3=5x+5$. So the final answer is $5x+5$.

**6.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Combine: $(5m^2+2m^2)+(-3m+m)=7m^2-2m$. So the final answer is $7m^2-2m$.

**7.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the minus: $7-2x-3+5x=3x+4$. So the final answer is $3x+4$.

**8.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute: $8a-4-a-3=7a-7$. So the final answer is $7a-7$.

**9.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Combine: $(x^2+3x^2)+(5x-2x)+(-2+6)=4x^2+3x+4$. So the final answer is $4x^2+3x+4$.

**10.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the minus: $8b+1-b+7=7b+8$. So the final answer is $7b+8$.

**11.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute: $3x^2-6+2x^2+10=5x^2+4$. So the final answer is $5x^2+4$.

**12.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the minus: $9p-4-4p+4=5p$. So the final answer is $5p$.

**13.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute the minus: $2x^2-x+3-x^2-4x+1=x^2-5x+4$. So the final answer is $x^2-5x+4$.

**14.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Distribute: $5y+10-4y+6=y+16$. So the final answer is $y+16$.

**15.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Add the three sides: $(x+2)+(2x-1)+(3x+4)=6x+5$. So the final answer is $6x+5$.

**16.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Profit $=(5x^2+3x)-(2x^2-x)=5x^2+3x-2x^2+x=3x^2+4x$. So the final answer is $3x^2+4x$.

**17.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Combine: $(4x^2+x^2)+(-2x+6x)+(7-3)=5x^2+4x+4$. So the final answer is $5x^2+4x+4$.

**18.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is "Subtract from" means $(7a+2)-(3a-5)=7a+2-3a+5=4a+7$. So the final answer is $4a+7$.

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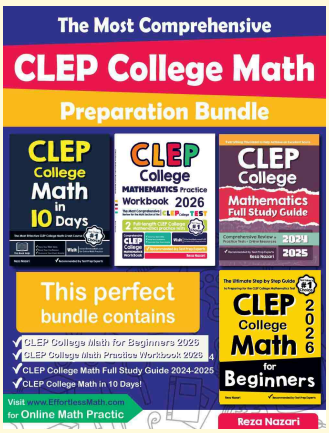


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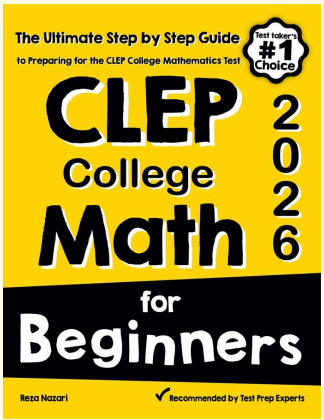


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