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

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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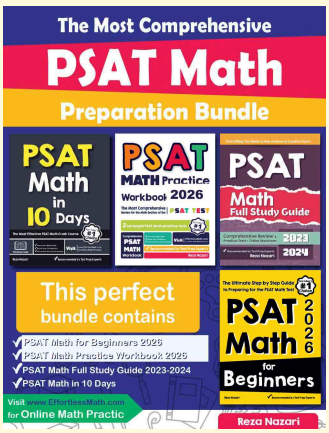

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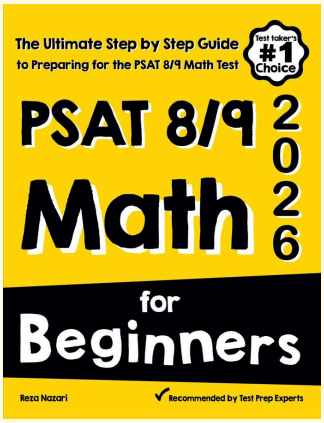

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