Adding and Subtracting Polynomials

Name: _____	Date: _____	Score: _____ / 24

Quick Review

A **polynomial** is a sum of terms, each made of a constant and a variable raised to a non-negative integer power. The **degree** is the highest exponent. Like terms have the same variable raised to the same power — those are the ones you combine. To **add** polynomials, drop the parentheses and combine like terms. To **subtract**, distribute the minus sign across every term in the second polynomial first (this is the single most common mistake), then combine. It's usually clearest to align like terms in columns or to color-code them mentally.

PRACTICE

Add or subtract.

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

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

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

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

5. $(x^2+4)-(x^2-7)$ _____

6. $(3x^2-x)-(x^2-x)$ _____

7. $(4x^3+2x)-(x^3-x)$ _____

8. $(x+y)+(2x-y)$ _____

9. $(2x^2+3x+1)+(x^2+x-4)$ _____

10. $(5x^2-2x)-(3x^2+x)$ _____

11. $(7x-1)+(2x+1)$ _____

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

13. $(6x^3-2x^2+x)-(2x^3-x^2+2x)$ _____

14. $(a+b)-(a-b)$ _____

15. $(x^2)+(x^2)$ _____

16. $-(x-3)+(x+3)$ _____

17. $(4x^2-3x+7)-(4x^2-3x+7)$ _____

18. $2(x+1)+(x-2)$ _____

19. $(x^2+5)+x$ _____

20. $(x^3-x)+(x-x^3)$ _____

♦ Word Problems

21. A rectangular garden has length x^2+3 feet and width $x+1$ feet. Write and simplify an expression for its perimeter.

_____

22. A school fundraiser tracks revenue with $R=8x^2+50x$ and cost with $C=3x^2+20x+100$. Write the profit model $P=R-C$.

_____

23. Two storage boxes have volume models $V_1=2x^3+x$ and $V_2=x^3-x$. Write a simplified expression for their combined volume.

_____

24. A design model is split into two polynomial parts. The full model is $5x^2+2x-3$, and one part is x^2+5x-1. Find the missing part.

_____

Scan Me

Answer Keys

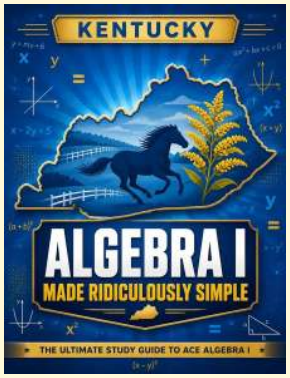
1. $3x + 8$
2. $3x^2$
3. $3x^2 + 2x + 7$
4. $2x - 3$
5. 11
6. $2x^2$
7. $3x^3 + 3x$
8. $3x$
9. $3x^2 + 4x - 3$
10. $2x^2 - 3x$
11. $9x$
12. $3x^2$
13. $4x^3 - x^2 - x$
14. $2b$
15. $2x^2$
16. 6
17. 0
18. $3x$
19. $x^2 + x + 5$
20. 0
21. $2x^2 + 2x + 8$
22. $P = 5x^2 + 30x - 100$
23. $3x^3$
24. $4x^2 - 3x - 2$

Step-by-Step Tutor Notes

1. Focus on the main idea of the problem, then simplify carefully. Combine: $x + 2x = 3x$; $3 + 5 = 8$. So the answer is $3x + 8$.
2. Start with the definition the problem is testing, then apply it directly. $3x^2 + 0x = 3x^2$. So the answer is $3x^2$.
3. Use the clue in the question first, then let the arithmetic finish the job. Sort by degree. So the answer is $3x^2 + 2x + 7$.
4. This is a good place to slow down, check the notation, and simplify cleanly. $5x - 3x = 2x$; $-2 - 1 = -3$. So the answer is $2x - 3$.
5. Start with the definition the problem is testing, then apply it directly. $x^2 - x^2 = 0$; $4 - (-7) = 11$. So the answer is 11.
6. This is a good place to slow down, check the notation, and simplify cleanly. $2x^2 + 0x$. So the answer is $2x^2$.
7. Take it one clear step at a time and keep the original question in mind. $4x^3 - x^3 = 3x^3$; $2x - (-x) = 3x$. So the answer is $3x^3 + 3x$.
8. Take it one clear step at a time and keep the original question in mind. $y - y = 0$. So the answer is $3x$.
9. Start with the definition the problem is testing, then apply it directly. Combine by degree. So the answer is $3x^2 + 4x - 3$.
10. Take it one clear step at a time and keep the original question in mind. $5 - 3 = 2$; $-2 - 1 = -3$. So the answer is $2x^2 - 3x$.
11. Focus on the main idea of the problem, then simplify carefully. Constants cancel. So the answer is $9x$.
12. Focus on the main idea of the problem, then simplify carefully. All other terms cancel. So the answer is $3x^2$.
13. This is a good place to slow down, check the notation, and simplify cleanly. Distribute minus, then combine. So the answer is $4x^3 - x^2 - x$.
14. This is a good place to slow down, check the notation, and simplify cleanly. $a - a = 0$; $b - (-b) = 2b$. So the answer is $2b$.
15. This is a good place to slow down, check the notation, and simplify cleanly. Coefficients $1 + 1 = 2$. So the answer is $2x^2$.
16. Use the clue in the question first, then let the arithmetic finish the job. $-x + x = 0$; $3 + 3 = 6$. So the answer is 6.
17. Look for the key feature the question asks about, such as a zero, intercept, or vertex. Polynomial minus itself is zero. That leads to 0.
18. Use the clue in the question first, then let the arithmetic finish the job. $2x + 2 + x - 2 = 3x$. So the answer is $3x$.
19. Take it one clear step at a time and keep the original question in mind. All different terms — just write them. So the answer is $x^2 + x + 5$.
20. This is a good place to slow down, check the notation, and simplify cleanly. All terms cancel. So the answer is 0.
21. $P = 2(\ell + w) = 2(x^2 + 3 + x + 1) = 2(x^2 + x + 4) = 2x^2 + 2x + 8$.
22. $P = (8x^2 + 50x) - (3x^2 + 20x + 100) = 5x^2 + 30x - 100$ after distributing the minus.
23. Set up the model from the story, then calculate carefully. $(2x^3 + x) + (x^3 - x) = 3x^3$. The x terms cancel.
24. Other = sum − first = $(5x^2 + 2x - 3) - (x^2 + 5x - 1) = 5x^2 - x^2 + 2x - 5x - 3 + 1 = 4x^2 - 3x - 2$.

Scan Me

Want a Full Algebra 1 Textbook? Try Our Kentucky KSA Made Simple Book!



Kentucky KSA Algebra I Made Ridiculously Simple

The friendly, step-by-step Algebra 1 textbook
Plain-English explanations, guided practice, and review support.

Scan Me

Full Lessons Inside

Concepts
Practice
Mastery

Important: All our test books contain **unique, completely different tests** from each other! Each book offers fresh practice questions—no repeats!

5 Practice Tests

- ✓ 5 complete practice tests with detailed explanations
- ✓ Perfect foundation for KSA test preparation
- ✓ Builds confidence and test-taking skills
- ✓ High-quality questions aligned with state standards

Start your practice journey!

6 Practice Tests

- ✓ 6 complete practice tests with detailed explanations
- ✓ **Unique tests**—different from the 5 tests book
- ✓ Perfect for more practice after mastering 5 tests
- ✓ Builds even more confidence and test-taking skills
- ✓ Same high-quality questions aligned with standards

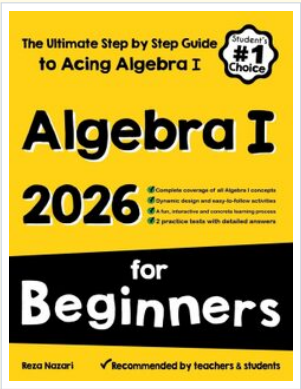
Take your practice to the next level!

7 Practice Tests

- ✓ 7 complete practice tests for maximum preparation
- ✓ **Unique tests**—different from 5 and 6 tests books
- ✓ The most comprehensive practice for Algebra 1
- ✓ Ideal for students aiming for top scores
- ✓ Extensive practice builds mastery and confidence

Go all the way with comprehensive practice!

☐ STUDENT FAVORITE • Master Algebra I From the Ground Up ☐



Algebra I for Beginners

Written by a top math teacher & aligned with national and state Algebra I courses. From linear equations to graphing quadratics — explained the easy way.

- ✓ **Complete coverage** of every Algebra I concept — perfect companion to these worksheets
- ✓ **Step-by-step explanations** with worked examples on every topic
- ✓ **QR codes in every chapter** for free video lessons & bonus practice
- ✓ **2 full-length practice tests** with detailed answer keys

✓ 100% Guaranteed
✓ Lifetime Support
✓ Trusted by Teachers

⋆ STUDENT'S #1 CHOICE ⋆

Teacher-recommended • 12,000+ Happy Students

Start Your Algebra Journey Today! →

↓PDF EDITION

Scan Me

Instant download • any device

☐ PAPERBACK

Scan Me

Paperback on Amazon

Hold it in your hands

Pair these free worksheets with *Algebra I for Beginners* and you have a complete self-paced course — concept lessons, daily practice, and full exam-style reviews, all in one path. →
EffortlessMath.com/product/algebra-i-for-beginners