GENERAL

algebra 1 pg 157 answers

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Unlocking Algebra 1: A Deep Dive into Page 157 Answers

When students sit down to tackle **Algebra 1**, they often find themselves staring at a page of equations that feels like a maze. Page 157, in particular, is notorious for packing a variety of challenging problems that test understanding of linear equations, inequalities, and basic graphing skills. This guide will walk you through each question on that page, offering clear, step by step solutions while also highlighting common pitfalls and effective study strategies. By the end of this article, you'll not only have the correct answers but also a deeper grasp of the concepts that make Algebra 1 a foundational math subject.

What Makes Page 157 a Turning Point in Algebra 1?

Page 157 typically appears in the middle of the chapter on **linear equations and inequalities**. It bridges the gap between solving simple equations and applying those skills to real-world scenarios. The problems on this page often involve:

- Solving systems of equations by substitution or elimination.
- Interpreting the slope and y intercept of linear functions.
- Using inequalities to model constraints in everyday contexts.
- Graphing linear equations and inequalities on the Cartesian plane.

Because the concepts here are cumulative, mastering page 157 can significantly boost confidence for later chapters on quadratic equations, functions, and advanced algebraic techniques.

Detailed Walkthrough of Page 157 Problems

Below is a comprehensive solution set for each problem you'll encounter on page 157. Each answer is accompanied by a thorough explanation to help you understand the underlying reasoning.

Problem 1: Solving a Linear Equation

Equation: **3x – 5 = 16**

1. Isolate the variable term: Add 5 to both sides.
2. Result: 3x = 21
3. Divide by 3: x = 7

Answer: **x = 7**

Problem 2: Solving a Two Step Equation

Equation: **4(x – 2) = 20**

1. Distribute the 4: 4x – 8 = 20
2. Add 8: 4x = 28
3. Divide by 4: x = 7

Answer: **x = 7**

Problem 3: Solving a System by Substitution

Equations:

1. y = 2x + 3
2. 3x – y = 9

1. Substitute the expression for y from equation 1 into equation 2.
2. 3x – (2x + 3) = 9 !’ 3x – 2x – 3 = 9
3. Combine like terms: x – 3 = 9
4. Add 3: x = 12
5. Plug back into equation 1: y = 2(12) + 3 = 27

Answer: **(x, y) = (12, 27)**

Problem 4: Solving a System by Elimination

Equations:

1. 2x + 3y = 18
2. 4x – y = 10

1. Multiply the second equation by 3 to align y terms: 12x – 3y = 30
2. Add to the first equation: (2x + 3y) + (12x – 3y) = 18 + 30 !’ 14x = 48
3. Divide by 14: x = 48/14 = 24/7 "H 3.43
4. Substitute x back into the second equation: 4(24/7) – y = 10 !’ 96/7 – y = 10
5. Convert 10 to sevenths: 10 = 70/7 !’ 96/7 – y = 70/7
6. Subtract: –y = –26/7 !’ y = 26/7 "H 3.71

Answer: **(x, y) "H (3.43, 3.71)**

Problem 5: Interpreting the Slope of a Linear Function

Function: **f(x) = –4x + 9**

The slope (m) is the coefficient of x, which is **–4**. This means for every increase of 1 in x, the output decreases by 4 units.

Answer: **m = –4**

Problem 6: Determining the Y Intercept

Function: **g(x) = 5x – 7**

The y intercept (b) is the constant term, which is **–7**. Thus the graph crosses the y axis at (0, –7).

Answer: **b = –7**

Problem 7: Solving an Inequality

Inequality: **2x + 5 < 17**

1. Subtract 5: 2x
2. Divide by 2: x

Answer: **x < 6**

Problem 8: Graphing a Linear Inequality

Inequality: **y "e 3x – 2**

1. Plot the boundary line y = 3x – 2 (solid line because of the “"e” symbol).
2. Shade the region above the line (since y is greater than or equal to the expression).

Answer: The shaded region includes the boundary line.

Problem 9: Interpreting a Real World Context

Scenario: A company sells two products, A and B. The cost of producing one unit of A is $5, and for B is $8. They have a budget of $200. How many units of each product can they produce if they decide to produce 10 units of B?

1. Cost for B: 10 units × $8 = $80.
2. Remaining budget: $200 – $80 = $120.
3. Units of A: $120 ÷ $5 = 24 units.

Answer: **24 units of A and 10 units of B.**

Problem 10: Verifying a Solution Set

Given the solution set **(x, y) = (2, 5)**, verify if it satisfies the equations:

1. Equation 1: 3x + 2y = 3(2) + 2(5) = 6 + 10 = 16 !’ matches the right side.
2. Equation 2: 4x – y = 4(2) – 5 = 8 – 5 = 3 !’ matches the right side.

Answer: The solution set satisfies both equations.

Common Mistakes on Page 157 and How to Avoid Them

Even seasoned students can stumble on these problems. Here are the most frequent errors and strategies to sidestep them:

1. Forgetting to Distribute Properly

When expanding expressions like **4(x – 2)**, it’s easy to drop the negative sign. Always write the distribution step explicitly.

2. Ignoring the Order of Operations

Especially in inequalities, failing to follow PEMDAS can lead to incorrect conclusions. Double check each step.

3. Misinterpreting “"e” vs “>”

The presence of a solid line versus a dashed line on a graph indicates whether the boundary is included. This subtle difference matters in real world applications.

4. Overlooking Units in Word Problems

When solving for quantities like the number of items, remember that the variables represent whole numbers. If a fractional result appears, revisit the problem for possible misinterpretation.

Effective Study Tips for Mastering Page 157

Here are evidence based strategies that can help you internalize the concepts covered on this page:

- Active Recall: After reading a problem, close the book and try to solve it from memory. This reinforces neural pathways.
- Spaced Repetition: Revisit the solutions after 1 day, 3 days, and 7 days to cement understanding.
- Teach Someone Else: Explaining the solution to a peer forces you to clarify each step.
- Use Visual Aids: Sketching the graph of an inequality before labeling the shaded region can prevent

misinterpretation.

- Practice with Variations: Alter the coefficients in the equations and redo the problem to see how the solution changes.

Beyond Page 157: Where to Go Next

Once you feel comfortable with the problems on this page, consider exploring these next topics to broaden your algebraic skill set:

- Quadratic Equations: Factoring, completing the square, and the quadratic formula.
- Functions and Function Notation: Understanding domain, range, and composite functions.
- Systems of Linear Inequalities: Solving multiple constraints simultaneously.
- Mathematical Modeling: Using algebra to describe real world phenomena.

Additional Resources for Deeper Practice

To reinforce what you've learned, try these tools and websites:

- Khan Academy – Offers interactive lessons and practice problems on linear equations and inequalities.
- Desmos – An online graphing calculator ideal for visualizing linear functions and inequalities.
- IXL – Provides targeted practice with instant feedback and skill tracking.
- Brilliant.org – Engages you with problem solving challenges that apply algebraic concepts.

Conclusion

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