GENERAL

algebra 2 performance task 1 answer

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Understanding Algebra 2 Performance Task 1: A Complete Guide

Algebra 2 performance tasks are designed to assess students' ability to apply algebraic concepts to real world problems. While many learners find these tasks challenging, a structured approach can turn them into rewarding learning experiences. This guide focuses on the most common "Algebra 2 Performance Task 1" that students encounter in middle and high school curricula, breaking down the problem, explaining the underlying concepts, and providing a step by step solution. Whether you're a student preparing for the test, a teacher looking for a clear explanation, or a tutor seeking additional resources, this article will give you a comprehensive understanding of the task and how to master it.

What Is an Algebra 2 Performance Task?

Unlike standard quizzes or exams that test isolated skills, performance tasks require students to demonstrate mastery of multiple algebraic ideas in a single, integrated problem. These tasks often involve:

- Formulating equations or systems of equations from a real world scenario.
- Manipulating algebraic expressions and functions.
- Graphing and analyzing relationships.
- Interpreting results in context.

Because the tasks assess higher order thinking, they are typically worth a significant portion of the overall grade and are often completed over several days.

Why Performance Tasks Matter

Performance tasks bridge the gap between abstract algebraic manipulation and practical problem solving. They:

1. Encourage critical thinking and creativity.
2. Help students see the relevance of algebra in everyday life.
3. Provide teachers with deeper insight into student understanding.
4. Prepare students for college level mathematics and STEM fields.

Common Structure of Performance Task 1

While the specifics of "Performance Task 1" can vary by district or textbook, the general framework often follows these steps:

1. Read the problem carefully and identify key information.
2. Translate the scenario into algebraic expressions or equations.
3. Solve the equations using appropriate techniques (factoring, quadratic formula, substitution, elimination).
4. Verify the solution in the context of the problem.
5. Present findings in a clear, organized format (written explanation, graph, or table).

Typical Example of Performance Task 1

Below is a representative example that many students encounter. It involves quadratic equations, systems of

equations, and graphing:

Problem:A company manufactures two types of widgets, A and B. The cost to produce one widget of type A is $4, and for type B it is $6. The company sold 300 widgets in total during a month, and the total revenue was $1,800. Additionally, the company's profit from each widget of type A was $2 more than the profit from each widget of type B. Find the number of each widget type sold.

While this example may differ in wording, it captures the core elements students must navigate: translating word problems into equations, solving a system, and interpreting results.

Step by Step Solution

Step 1: Define Variables

Let **x** = number of widget A sold.

Let **y** = number of widget B sold.

Step 2: Translate Information into Equations

1. Total widgets sold: **x + y = 300**

2. Total revenue: Since each widget A sells for $4 and each B sells for $6, the revenue equation is **4x + 6y = 1,800**.

3. Profit relationship: The profit per widget A is $2 more than per widget B. If the profit per B is p, then profit per A is p + 2. Profit per widget equals selling price minus cost. Therefore:

- Profit per A: \\\\(4 - 2 = 2\\\\)
- Profit per B: \\\\(6 - 4 = 2\\\\)

However, this leads to equal profits, contradicting the "$2 more" condition. To resolve this, we interpret the "profit" as the difference between selling price and cost, not the actual profit. In this scenario, the cost of producing one widget A is $4, and B is $6. The selling price is unknown, but we can use the profit difference to set up an additional equation. Let sA and sB be selling prices. Then:

- Profit per A: \\\\(s_A - 4\\\\)
- Profit per B: \\\\(s_B - 6\\\\)

Given \\\\(s_A - 4 = (s_B - 6) + 2\\\\). Simplifying:

\\\\(s_A - 4 = s_B - 4\\\\) !' \\\\(s_A = s_B\\\\).

Thus, the selling price for both types is equal. Let that price be P. Then the revenue equation becomes **Px + Py = 1,800** !**P(x + y) = 1,800**. Since x + y = 300, we have **P(300) = 1,800** !**P = 6**. Therefore, each widget sells for $6.

Now the profit per A is \\\\(6 - 4 = 2\\\\). The profit per B is \\\\(6 - 6 = 0\\\\). The profit per A is indeed $2 more than per B.

Thus, we have the system:

1. x + y = 300
2. 4x + 6y = 1,800

Solving the system using substitution or elimination yields:

From equation 1: \\\\(y = 300 - x\\\\).

Substitute into equation 2:

\\\\(4x + 6(300 - x) = 1,800\\\\)

\\\\(4x + 1,800 - 6x = 1,800\\\\)

\\\\(-2x = 0\\\\)

\\\\(x = 0\\\\)

Thus, \\\\(y = 300\\\\).

So, the company sold 0 widgets of type A and 300 widgets of type B.

Step 3: Verify the Solution

Check that the total revenue matches: \\\\(6(0) + 6(300) = 1,800\\\\). The profit per B is $0, and per A is $2, satisfying the “$2 more” condition.

Key Algebraic Concepts Covered

1. Systems of Linear Equations

Students learn to set up and solve systems using substitution, elimination, or matrix methods. Mastery of these techniques is essential for performance tasks that involve multiple variables.

2. Quadratic Equations

Many tasks require solving quadratics. Remember the three primary methods: factoring, completing the square, and the quadratic formula. Practice recognizing when each method is most efficient.

3. Word Problem Translation

Translating narrative information into algebraic expressions is a skill that improves with practice. Focus on identifying unknowns, constants, and relationships.

4. Graphing and Analysis

Plotting functions or data points helps visualize solutions. Use graphing calculators or software (Desmos, GeoGebra) to confirm algebraic results.

5. Units and Dimensional Analysis

Always keep track of units (e.g., dollars, widgets). This prevents errors in equations and helps verify that results make sense.

Common Mistakes and How to Avoid Them

- Misreading the Problem: Carefully read each sentence; small details can change the entire equation.
- Incorrect Variable Assignment: Assign variables consistently; swapping them can lead to wrong equations.
- Forgetting the Negative Sign: When moving terms across the equals sign, watch the sign change.
- Ignoring Units: Ensure that all terms in an equation have the same units.
- Overlooking Simplification: Simplify equations early to reduce complexity.

Practice Problems to Solidify Your Skills

Below are five practice problems inspired by typical performance tasks. Attempt them before reviewing the solutions.

1. Two types of pens cost $3 and $5 each. A shop sold 250 pens for a total of $1,200. How many of each type were sold?
2. A garden contains roses and lilies. The total number of flowers is 180, and the total number of petals is 1,260. Roses have 5 petals each, lilies have 8 petals each. Determine how many of each flower were planted.
3. A company offers two subscription plans: Basic at $10/month and Premium at $20/month. In a month, 400 subscriptions were sold for a total revenue of $8,000. How many of each plan were sold?
4. During a sale, a store sold 120 items for $3,600. Items were either hats costing $12 each or shirts costing $18 each. Determine how many hats and shirts were sold.
5. A student has a total of 45 minutes to study two subjects. If studying subject A takes 3 minutes per page and subject B takes 5 minutes per page, and the total number of pages studied is 20, how many pages of each subject did the student study?

Strategies for Success on Performance Tasks

1. Read the Entire Prompt First

Skim the problem to understand the context before diving into equations. This helps identify relevant data and potential relationships.

2. Create a Diagram or Table

Visual representations can clarify unknowns and relationships. Draw a simple table listing variables, constants, and equations.

3. Check for Hidden Constraints

Constraints like “profit per A is $2 more” often imply a relationship between variables that isn’t explicitly stated. Look for such clues.

4. Verify Units at Every Step

Maintain a consistent unit system. If you’re dealing with dollars and widgets, ensure that each term in an equation is in dollars or widgets, not a mix.

5. Use Multiple Methods to Verify Results

After solving algebraically, plug the solution back into the original problem to confirm it makes sense. If possible, graph the equations to see if the intersection point matches your solution.

6. Practice Time Management

Performance tasks often have time constraints. Allocate time for reading, planning, solving, and reviewing. Use a timer during practice sessions.

Resources for Further Learning

Baca Juga (Artikel Terkait)

- **advanced engineering electromagnetics solution manual edition hardcover by balanis constantine a published by wiley**

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