

Alton Shoveled Snow On $\frac{5}{6}$ Of His Driveway Before Lunch. Then He Shoveled $\frac{2}{7}$ Of It After Lunch. How

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Understanding how much of Alton's driveway he cleared before and after lunch requires breaking down the problem into manageable parts. This involves working with fractions and applying basic arithmetic principles. In this article, we will explore the problem step-by-step, analyze the fractions involved, and determine the total portion of the driveway that Alton shoveled, both before and after lunch, leading to a comprehensive understanding of the situation.

Breaking Down the Problem: What Is Being Asked?

Clarifying the Scenario

The problem describes two key activities:

- Before lunch, Alton shoveled $\frac{5}{6}$ of his driveway.
- After lunch, he shoveled an additional $\frac{2}{7}$ of the driveway.

The core question is: How much of the driveway did Alton shovel in total?

This requires summing two fractions representing parts of the driveway, which involves understanding fractions, common denominators, and addition.

Key Concepts Involved

To solve this problem, familiarity with the following concepts is essential:

1. Fractions and their interpretation as parts of a whole.
2. Adding fractions with different denominators.
3. Ensuring the sum does not exceed 1 (or 100%), as the driveway cannot be more than fully shoveled.

Understanding Fractions and Their Addition

The Fractions Involved

- The first fraction: **5/6** (shoveled before lunch)
- The second fraction: **2/7** (shoveled after lunch)

These fractions represent parts of the entire driveway, which we consider to be a whole (1 or 100%).

Why Do We Need a Common Denominator?

To add fractions accurately, they must have the same denominator:

- 6 and 7 are different denominators.
- The least common denominator (LCD) of 6 and 7 is 42.

Calculating the Total Shoveled Portion

Step 1: Convert Fractions to Equivalent Fractions with a Common Denominator

- Convert 5/6 to a fraction with denominator 42:
- Multiply numerator and denominator by 7:
 $5/6 = (5 \times 7)/(6 \times 7) = 35/42$
- Convert 2/7 to a fraction with denominator 42:
- Multiply numerator and denominator by 6:
 $2/7 = (2 \times 6)/(7 \times 6) = 12/42$

Step 2: Add the Fractions

- Sum: $35/42 + 12/42 = (35 + 12)/42 = 47/42$

Step 3: Interpret the Result

- 47/42 is an improper fraction, which indicates the total portion exceeds 1.
- Convert to mixed number:
 $47/42 = 1 + 5/42$
- Implication: Alton shoveled more than the entire driveway (more than 100%).

Understanding the Result: Did Alton Shovel the Entire Driveway?

Possible Interpretations

- Since the sum exceeds 1, it suggests Alton shoveled the entire driveway and then some.
- It may also imply that the problem is conceptual, illustrating that the combined effort exceeds the total size if taken literally.

Assuming the Whole Driveway

- The total shoveled is 1 (the entire driveway) plus an extra $\frac{5}{42}$, which is physically impossible unless the initial fractions are partial representations, and the total is capped at 1.
- Therefore, in real-world terms, Alton shoveled the entire driveway, and the extra fraction indicates overlap or an overestimation.

Alternative Perspective: How Much of the Driveway Did He Shovel?

Considering the Total as a Maximum of 1

- The total area shoveled cannot surpass 1.
- Since the sum exceeds 1, it implies Alton completed the entire driveway (or more), but practically, he only shoveled the whole driveway.

Summary of Shoveling Effort

- Before lunch: $\frac{5}{6}$ of the driveway (~83.33%)
- After lunch: $\frac{2}{7}$ of the driveway (~28.57%)
- Total combined effort (conceptually): $\frac{47}{42}$ (~111.9%), so practically, 100%.

Conclusion: Final Analysis and Practical Implications

What Does This Mean?

- The fractions demonstrate that Alton shoveled more than the entire driveway when combining both efforts.
- In real-world terms, this indicates he completed the entire driveway during the day.
- The overlapping fractions serve as a mathematical illustration rather than a literal measure exceeding 100%.

Key Takeaways

- Adding fractions with different denominators requires finding the least common denominator.
- The total fraction of the driveway shoveled exceeds 1, indicating the entire driveway was cleared.
- Understanding fractions and their addition is crucial for solving similar real-world problems involving parts of a whole.

Final Thoughts

This problem provides a practical example of working with fractions, emphasizing the importance of common denominators and the interpretation of improper fractions. Whether for academic purposes or real-life applications like estimating work done, mastering these concepts enhances problem-solving skills and mathematical literacy.

Meta Description:

Discover how to add fractions representing parts of a driveway shoveled by Alton before and after lunch. Learn step-by-step how to compute the total effort and interpret the results accurately.

Keywords:

Alton snow shoveling, fractions addition, how much of driveway shoveled, math problem solving, fractions with different denominators, real-world math examples, simple fraction calculations, understanding improper fractions

Frequently Asked Questions

How much of Alton's driveway did he shovel before lunch?

He shoveled $\frac{5}{6}$ of his driveway before lunch.

What fraction of the driveway did Alton shovel after lunch?

He shoveled $\frac{2}{7}$ of his driveway after lunch.

Did Alton shovel the entire driveway in one day?

No, he shoveled $\frac{5}{6}$ before lunch and $\frac{2}{7}$ after lunch, so he did not complete the entire driveway.

What is the combined fraction of the driveway that Alton shoveled in total?

The total fraction is $\frac{5}{6} + \frac{2}{7}$, which can be combined by finding a common denominator.

What is the sum of $\frac{5}{6}$ and $\frac{2}{7}$?

The sum is $(\frac{5}{6}) + (\frac{2}{7}) = (\frac{35}{42}) + (\frac{12}{42}) = \frac{47}{42}$, which is more than the whole driveway.

Did Alton shovel more than the entire driveway?

Yes, based on the sum $\frac{47}{42}$, he shoveled more than a full driveway, which suggests some overlap or double-shoveling.

What is the significance of the fractions $\frac{5}{6}$ and $\frac{2}{7}$ in this context?

They represent the portions of the driveway shoveled before and after lunch, respectively.

How can we interpret the total shoveling effort based on these fractions?

Since the total exceeds 1 (a whole), it indicates that parts of the driveway were shoveled more than once or that the fractions are approximate.

Additional Resources

Alton Shoveled Snow On $\frac{5}{6}$ Of His Driveway Before Lunch. Then He Shoveled $\frac{2}{7}$ Of It After Lunch. How is a classic problem that combines fractions, problem-solving skills, and logical reasoning. This problem has become a popular example in math education because it encourages students and enthusiasts to think critically about parts and wholes, as well as to interpret word problems carefully. In this article, we will explore the problem in detail, analyze its components, and provide a comprehensive guide on how to approach and solve it effectively.

Understanding the Problem

Restating the Problem

Alton Shoved snow on his driveway in two distinct sessions:

- Before lunch, he shoveled $\frac{5}{6}$ of his driveway.
- After lunch, he shoveled $\frac{2}{7}$ of his driveway.

The question posed is: How much of his driveway did Alton shovel in total?

At first glance, the problem appears simple, but it requires careful interpretation and accurate calculation to arrive at the correct answer.

Key Concepts Involved

This problem involves several important mathematical ideas:

- Fractions: understanding parts of a whole.
- Addition of fractional parts: combining segments to find the total.
- Common denominators: necessary for adding fractions.
- Logical reasoning: understanding how parts relate to the whole driveway.

Breaking Down the Problem

Step 1: Analyzing the First Shoveling Session

Alton shoveled $\frac{5}{6}$ of his driveway before lunch. This indicates that more than half of the driveway was cleared in this session.

Features:

- Represents a significant portion.
- Leaves a remaining part of $\frac{1}{6}$ unshoveled before lunch.

Implication:

If the driveway is considered as a whole (say, 1 unit), then:

- Shoveled before lunch: $\frac{5}{6}$
- Remaining after lunch: $\frac{1}{6}$

Step 2: Analyzing the Second Shoveling Session

After lunch, Alton shoveled $\frac{2}{7}$ of the driveway.

Features:

- This is a smaller part compared to what was shoveled before lunch.
- The question arises: Are these parts additive? Do they refer to the same whole?

Important clarification:

The problem states " $\frac{5}{6}$ of his driveway" and " $\frac{2}{7}$ of it," implying both fractions refer to the same driveway, which is the standard assumption unless specified otherwise.

Step 3: Combining the Portions

To find the total amount of driveway shoveled, we need to add the two parts:

- $\frac{5}{6}$ (before lunch)
- $\frac{2}{7}$ (after lunch)

Calculation:

Total shoveled = $\frac{5}{6} + \frac{2}{7}$

Calculating the Total Shoveled Area

Step 1: Find a Common Denominator

To add fractions, they must have the same denominator.

- Denominators: 6 and 7
- Least common denominator (LCD): 42

Convert each fraction:

- $\frac{5}{6} = \frac{(5 \times 7)}{(6 \times 7)} = \frac{35}{42}$
- $\frac{2}{7} = \frac{(2 \times 6)}{(7 \times 6)} = \frac{12}{42}$

Sum:

$\frac{35}{42} + \frac{12}{42} = \frac{(35 + 12)}{42} = \frac{47}{42}$

Step 2: Interpret the Result

The sum is $\frac{47}{42}$.

Since $\frac{47}{42}$ is greater than 1 (which is $\frac{42}{42}$), the total shoveled exceeds the entire

driveway:

- Total shoveled = $47/42 = 1 + 5/42$

Meaning:

Alton shoveled more than the entire driveway once, specifically, one full driveway plus an additional $5/42$ of it.

Implications and Conclusions

What does this tell us?

- Alton shoveled the entire driveway at least once, and then some.
- The total amount shoveled exceeds the size of the driveway, implying he might have:
- Shoveled the driveway twice (once fully, and then some more),
- Or, the problem simply asks for the sum of fractions representing parts of the same driveway, regardless of whether it exceeds the whole.

Practical Interpretation

In real-world terms, this could mean:

- Alton shoveled the entire driveway once (1 full driveway),
- And then, in his second session, he shoveled an additional $5/42$ of the driveway's area, which is roughly 11.9% of the driveway.

Summary:

- Total area shoveled = $1 \frac{5}{42}$ of the driveway.
- Total fraction exceeding the full driveway indicates overlapping or double-shoveling of some parts, or an accounting of multiple passes.

Alternative Perspectives and Deeper Analysis

Is the problem asking for total area or total passes?

- If interpreted literally, the sum exceeds 1, indicating multiple passes over the same area.
- If considering the total unique area shoveled, the total is capped at 1 (the whole driveway).

Therefore, the problem exemplifies:

- How adding parts can lead to a total exceeding the whole.

- The importance of understanding whether parts are overlapping or disjoint.

Real-world applications

- Usage in resource management: understanding cumulative efforts.
- Planning tasks: avoiding double counting.
- Educational value: teaching fractions and addition.

Pros and Cons of the Problem

Pros

- Educational Clarity: Helps students understand the addition of fractions and common denominators.
- Critical Thinking: Encourages interpretation of word problems beyond surface-level reading.
- Mathematical Insight: Demonstrates how fractions relate to parts of a whole and the concept of exceeding a total.

Cons

- Potential Confusion: Overlapping areas can be misinterpreted as cumulative unless explicitly clarified.
- Ambiguity in Real-World Context: It might seem unrealistic for someone to shovel more than the entire driveway unless multiple passes are considered.
- Requires Background Knowledge: Understanding fractions and common denominators is essential; beginners may find it challenging.

Features and Variations of Similar Problems

Features:

- Focus on adding fractions with different denominators.
- Emphasize understanding parts of a whole.
- Incorporate real-world contexts like construction, cooking, or resource allocation.

Variations:

- Problems where fractions represent different quantities of the same object.
- Scenarios involving multiple workers or multiple tasks.
- Incorporating subtraction or comparison of fractional parts.

Conclusion

The problem of Alton Shoveled Snow On $\frac{5}{6}$ Of His Driveway Before Lunch. Then He Shoveled $\frac{2}{7}$ Of It After Lunch. How is a rich mathematical scenario that demonstrates the importance of careful fraction addition, interpretation of word problems, and understanding of parts and wholes. The combined total, $\frac{47}{42}$, reveals that Alton shoveled more than the entire driveway once, indicating multiple passes or overlapping efforts. This problem not only provides a platform for practicing fraction addition but also encourages critical thinking about real-world applications and problem interpretations.

By understanding the fundamental concepts involved and carefully performing the calculations, students and enthusiasts can appreciate the subtleties of fractional parts and their sums. Whether used for educational purposes or as a brain teaser, this problem exemplifies the elegance and utility of basic mathematical principles in everyday contexts.

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