

It Cost Brody \$9.80 To Send 196 Text Messages. How Many Text Messages Did He Send If He Spent \$4.20?

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Understanding how to determine the number of text messages Brody sent based on his total expenditure involves exploring basic concepts of unit cost and proportional reasoning. When we know the total cost for a certain number of messages, we can find the cost per message and then use that to calculate how many messages he could send with a different amount of money. This problem not only helps sharpen math skills but also demonstrates practical applications such as budgeting and cost estimation in everyday life.

Breaking Down the Problem

Given Data

- Total cost for 196 messages = \$9.80
- Amount Brody spent = \$4.20

What Is Being Asked?

Determine how many text messages Brody sent if he spent only \$4.20, assuming the cost per message remains consistent.

Understanding Cost Per Message

Calculating the Cost of One Message

To find the cost per message, divide the total cost by the number of messages sent:

Cost per message = Total cost / Number of messages

Applying the given data:

Cost per message = \$9.80 / 196

Performing the Calculation

1. Convert dollars to a decimal for ease of calculation, though it's already in decimal form.
2. Divide 9.80 by 196:

Cost per message = $9.80 \div 196 \approx 0.05$

Thus, each message costs approximately \$0.05.

Implication of Cost per Message

Knowing that each message costs about five cents simplifies the process of calculating how many messages Brody could send with any given amount of money.

Calculating the Number of Messages Brody Sent with \$4.20

Using the Cost per Message

Divide the total amount spent (\$4.20) by the cost per message (\$0.05):

Number of messages = Total amount spent / Cost per message

Performing the Calculation

1. Set up the division:

Number of messages = $4.20 \div 0.05$

1. Calculate:

Number of messages = 84

Final Answer

Brody sent 84 text messages when he spent \$4.20.

Understanding the Relationship Between Cost and Number of Messages

Proportional Reasoning

This problem exemplifies proportionality. Since the cost per message remains constant, the number of messages is directly proportional to the amount of money spent. If Brody spends less money, he can only send fewer messages; if he spends more, he can send more.

Visualizing the Proportion

- Cost per message = \$0.05
- Amount spent = variable
- Number of messages = (Amount spent) / \$0.05

Examples of Similar Problems

1. If Brody had spent \$2.50 instead of \$4.20, how many messages could he have sent?
2. What if the cost per message changed to \$0.10? How would that affect the number of messages sent for a given amount?

Additional Considerations

Assumptions Made

- The cost per message is uniform for all messages sent.
- No additional fees or taxes are involved.
- Brody's total expenditure is solely for message sending, without other charges.

Real-World Applications

This type of calculation is relevant in many scenarios, such as:

- Planning mobile phone usage within a budget.
- Understanding data or message plans offered by telecom providers.
- Estimating costs for bulk messaging or marketing campaigns.

Summary

By calculating the cost per message based on Brody's initial data—\$9.80 for 196 messages—we found that each message costs approximately \$0.05. Using this rate, we determined that Brody would have sent 84 messages if he spent only \$4.20. This problem highlights the importance of understanding unit costs and proportionate reasoning, skills that are applicable in various everyday financial decisions and business scenarios.

Frequently Asked Questions

What is the cost per text message Brody paid?

Brody paid \$9.80 for 196 messages, so the cost per message is $\$9.80 \div 196 = \0.05 per message.

How many text messages did Brody send if he spent \$4.20?

Using the cost per message (\$0.05), the number of messages sent is $\$4.20 \div \$0.05 = 84$ messages.

If Brody's cost per message remains the same, how much would it cost him to send 250 messages?

At \$0.05 per message, 250 messages would cost $250 \times \$0.05 = \12.50 .

What is the total amount Brody would spend if he sent 300 messages at the same rate?

At \$0.05 per message, 300 messages would cost $300 \times \$0.05 = \15.00 .

How can Brody reduce his texting costs based on the given rate?

Brody can reduce costs by sending fewer messages, switching to a plan with a lower per-message

rate, or using free messaging apps.

Is the cost per message consistent regardless of the number of messages sent?

Yes, based on the initial data, the cost per message remains constant at \$0.05, assuming no additional fees or discounts.

Additional Resources

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In the realm of mobile communication, understanding the cost per message can often seem straightforward, but it can also reveal intriguing mathematical insights when examined closely.

Recently, Brody found himself pondering a simple yet thought-provoking question: If it cost him \$9.80 to send 196 text messages, how many messages could he send if he only spent \$4.20? This question isn't just about basic arithmetic; it explores the core concepts of unit rates, proportionality, and cost analysis—elements that are fundamental in budgeting and telecommunications planning.

In this article, we dive into the details of Brody's texting costs, analyze how to determine the cost per message, and then use that information to find out how many messages he could send within a different budget. We'll approach this systematically, breaking down the problem into manageable parts, and providing a clear, reader-friendly explanation of the mathematics behind it.

Understanding the Problem: The Basic Data

Before jumping into calculations, it's important to clearly identify the known variables:

- Total cost for 196 messages: \$9.80
- Number of messages sent: 196 messages
- Brody's new budget: \$4.20

The core question is: Given the cost structure, how many messages can Brody send if he spends only \$4.20?

This problem involves understanding the relationship between total cost and number of messages, which is best approached through concepts like unit rate (cost per message) and proportional reasoning.

Determining the Cost Per Message

The first step is to find out how much Brody pays, on average, for each message. This is known as the unit rate—the cost per individual message.

Calculating the Cost per Message

The calculation involves dividing the total cost by the total number of messages:

$$\text{Cost per message} = \frac{\text{Total Cost}}{\text{Number of Messages}}$$

Plugging in Brody's data:

$$\text{Cost per message} = \frac{\$9.80}{196}$$

To compute this accurately, perform the division:

$$\frac{9.80}{196}$$

Divide numerator and denominator by 2 to simplify:

$$\frac{9.80 \div 2}{196 \div 2} = \frac{4.90}{98}$$

Now, divide 4.90 by 98:

$$4.90 \div 98 \approx 0.05$$

Thus, the cost per message is approximately \$0.05, or 5 cents.

Verification:

- Multiplying the cost per message by 196:

$$0.05 \times 196 = 9.80$$

which matches Brody's total cost, confirming the calculation.

Significance of the Cost per Message

Knowing that each message costs approximately \$0.05 allows us to determine how many messages Brody can send with a different amount of money, maintaining the proportionality.

Calculating the Number of Messages for a New Budget

Having established the cost per message, the next step is to determine how many messages Brody can send if he only spends \$4.20.

Applying the Unit Rate

The problem reduces to:

$$\text{Number of Messages} = \frac{\text{Total Budget}}{\text{Cost per message}}$$

Insert the known values:

$$\text{Number of Messages} = \frac{\$4.20}{\$0.05}$$

Perform the division:

$$\frac{4.20}{0.05}$$

To simplify, multiply numerator and denominator by 100 to clear decimals:

$$\frac{4.20 \times 100}{0.05 \times 100} = \frac{420}{5}$$

Now divide:

$$420 \div 5 = 84$$

Therefore, Brody can send 84 messages if he spends only \$4.20.

Validating the Calculation

- Multiply the number of messages by the per-message cost:

$$84 \times 0.05 = 4.20$$

which matches Brody's new budget, confirming the calculation's accuracy.

Implications and Real-World Applications

While this problem is straightforward mathematically, it highlights several important real-world concepts:

- Understanding unit rates helps consumers compare costs of different plans or services.
- Proportional reasoning is essential for budgeting, especially when dealing with variable costs.
- Cost efficiency: Knowing the cost per message allows users to maximize their messaging within a budget.

Practical Usage

- Telecommunications planning: Providers often set plans based on per-message or per-minute rates. Consumers can analyze these to choose the most economical options.
- Budgeting for communication: Individuals can determine how many messages they can afford based on their monthly budget.
- Business applications: Companies managing communication costs can use such calculations to optimize expenses.

Limitations and Assumptions

This problem assumes:

- The cost per message remains constant regardless of the number sent.
- There are no additional fees, taxes, or discounts.
- The calculation is based on average costs, which might vary in real plans with tiered rates or packages.

Summary and Final Thoughts

Brody's question about how many messages he can send with a different budget underscores the importance of understanding unit rates and proportional reasoning. By calculating the cost per message as approximately \$0.05, we can confidently determine that with \$4.20, he could send 84

messages.

This exercise exemplifies how simple mathematical principles underpin everyday decisions—whether managing personal communication costs or making strategic business plans. Recognizing the cost per unit allows consumers and providers alike to make informed choices, optimize resources, and avoid surprises.

In conclusion, the key takeaway is that mathematical literacy, especially in understanding ratios and proportionality, empowers individuals to navigate their financial and logistical decisions more effectively. For Brody and many others, such calculations are more than academic—they are tools for smarter spending and planning in a digital age.

In essence:

- Cost per message: approximately \$0.05
- Messages affordable with \$4.20: 84 messages

Understanding these basic principles ensures better control over communication expenses and highlights the broader relevance of mathematical reasoning in everyday life.

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