

Natasha's Bikes Rents Bikes For \$16 Plus \$4 Per Hour. Micaela Paid \$36 To Rent A Bike. For How Many Hours

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When considering bike rentals, understanding the pricing structure is essential to determine how long you can rent a bike based on your budget. In this case, Natasha's Bikes offers a rental service where customers pay a flat fee of \$16 plus an additional \$4 for each hour they rent the bike. Micaela paid a total of \$36 for her bike rental, and the question arises: for how many hours did Micaela rent the bike? This article will explore the problem step-by-step, providing a clear method to find the number of hours Micaela rented the bike, along with insights into similar rental pricing problems.

Understanding the Rental Pricing Structure

Fixed Fee and Hourly Rate

Natasha's Bikes has a straightforward pricing model:

- Flat fee: \$16
- Hourly rate: \$4 per hour

This means that regardless of the rental duration, a customer must pay at least \$16, and for each additional hour, an extra \$4 is added to the total.

Formulating the Problem

To determine how many hours Micaela rented the bike, we can model the total cost as a function of hours:

- Let h be the number of hours Micaela rented the bike.
- The total cost C is given by:

$$C = 16 + 4h$$

Since Micaela paid \$36, we can set up the equation:

$$36 = 16 + 4h$$

Our goal is to solve for h , the number of hours.

Solving the Problem Step-by-Step

Step 1: Write the Equation

From the problem statement:

- Total cost: \$36
- Flat fee: \$16
- Hourly rate: \$4

Therefore:

$$36 = 16 + 4h$$

Step 2: Isolate the Variable

Subtract \$16 from both sides:

$$36 - 16 = 4h$$

Calculate:

$$20 = 4h$$

Step 3: Solve for h

Divide both sides by 4:

$$h = 20 / 4 = 5$$

Thus, Micaela rented the bike for 5 hours.

Interpreting the Result

The calculation shows that Micaela rented the bike for 5 hours, which aligns with the total cost paid. This kind of problem is common when dealing with linear pricing models, especially in rental services where there is a fixed fee plus a variable hourly charge. Understanding how to set up and solve such equations is a useful skill in both academic and real-world scenarios.

Additional Examples of Rental Pricing Problems

Understanding the structure of rental costs can help in various situations. Here are some similar problems and how to approach them:

Example 1: Different Fixed and Hourly Rates

Suppose a car rental company charges a \$25 flat fee plus \$10 per day. If a customer pays \$85, how many days did they rent the car?

- Set up the equation:

$$85 = 25 + 10d$$

- Solve for d :

$$85 - 25 = 10d \quad \square \quad 60 = 10d \quad \square \quad d = 6$$

- The customer rented the car for 6 days.

Example 2: Rental with Discounts or Additional Fees

Imagine a bike rental where the flat fee is \$20, but there's a \$2 surcharge for rentals over 4 hours. If someone pays \$30, how many hours did they rent the bike?

- First, subtract the flat fee:

$$30 - 20 = 10$$

- Since there's a surcharge only for rentals over 4 hours, determine if the rental duration exceeds 4 hours:

- If $h \leq 4$, then total cost is just $\$20 + \$4h$.

- If $h > 4$, then total cost is $\$20 + \$4h + \$2$.

- To confirm, test for $h = 5$:

$20 + 4(5) + 2 = 20 + 20 + 2 = 42$ (which exceeds \$30), so the rental must be less than 5 hours.

- For $h = 4$:

$20 + 4(4) = 20 + 16 = 36$ (less than \$30), so the rental duration is 4 hours or less.

- Since the total paid was \$30, and the base cost for 4 hours is \$36, the customer might have paid a discounted rate or there might be additional context. This example illustrates how additional fees or discounts complicate calculations.

Practical Tips for Solving Rental Pricing Problems

- **Identify fixed and variable costs:** Break down the total cost into fixed fees and per-unit charges.
- **Set up equations:** Use variables to represent unknown quantities such as hours or days.
- **Solve algebraically:** Isolate variables to find the unknown rental duration.
- **Check units and constraints:** Ensure that the calculated duration makes sense within the context of the problem.

Conclusion

In conclusion, Micaela rented a bike for 5 hours based on the given pricing structure of Natasha's Bikes, where the total cost comprises a flat fee of \$16 plus \$4 per hour. By translating the problem into a simple algebraic equation and solving it step-by-step, we can accurately determine rental durations for various costs and pricing models. Understanding these principles can help consumers make informed decisions about rentals and help businesses structure their prices effectively. Whether

you're planning to rent a bike, a car, or any other service with similar pricing, mastering this problem-solving approach is invaluable.

Frequently Asked Questions

How much does Natasha's Bikes charge per hour for renting a bike?

They charge \$4 per hour.

What is the initial flat fee for renting a bike at Natasha's Bikes?

The initial flat fee is \$16.

If Micaela paid \$36 to rent a bike, how much was the hourly charge?

The hourly charge was \$20, since $\$36 - \$16 = \$20$.

How many hours did Micaela rent the bike for?

Micaela rented the bike for 5 hours.

What is the general formula to find how many hours Micaela rented the bike?

Number of hours = (Total paid - flat fee) $\div$ hourly rate, so $(36 - 16) \div 4 = 5$ hours.

Can the total rental cost be less than \$16 at Natasha's Bikes?

No, because the flat fee of \$16 is charged regardless of hours rented.

What would be the total cost if someone rented a bike for 8 hours at Natasha's Bikes?

The total cost would be $\$16 + (8 \times \$4) = \$48$.

Additional Resources

Natasha's Bikes Rents Bikes For \$16 Plus \$4 Per Hour. Micaela Paid \$36 To Rent A Bike. For How Many Hours?

In the world of urban commuting and leisure activities, bike rentals have become an increasingly popular choice for many individuals seeking an affordable and eco-friendly transportation option. Natasha's Bikes, a local rental shop, offers a straightforward pricing scheme: a flat fee plus an hourly rate. Recently, a customer named Micaela rented a bike from Natasha's and paid a total of \$36. The key question arises: How many hours did Micaela rent the bike? This seemingly simple problem involves understanding basic algebraic principles and translating a real-world scenario into a solvable mathematical model. This article delves into the details of Natasha's pricing structure, how to set up the problem, and the steps to find the solution, providing readers with a clear and comprehensive understanding of the process.

Understanding the Pricing Structure at Natasha's Bikes

Before solving the problem, it's essential to grasp the specifics of Natasha's rental policy:

- Flat fee: \$16 (charged once at the beginning of the rental)
- Hourly fee: \$4 per hour (charged for each hour the bike is rented)

This pricing scheme implies that the total cost (T) for renting a bike can be expressed mathematically

as:

$$T = \text{Flat fee} + (\text{Hourly rate} \times \text{Number of hours})$$

Applying the given values:

$$T = 16 + 4h$$

where:

- T is the total amount paid
- h is the number of hours the bike is rented

This linear relationship allows us to set up an equation based on the total amount Micaela paid.

Setting Up the Mathematical Model

Given:

- Total amount paid, $T = 36$
- Flat fee = 16 dollars
- Hourly rate = 4 dollars per hour
- Unknown: number of hours, h

The equation becomes:

$$36 = 16 + 4h$$

This is a straightforward linear equation with one variable.

Solving for the Number of Hours

The goal is to find the value of h that satisfies the equation.

Step 1: Subtract the flat fee from both sides:

$$36 - 16 = 4h$$

$$20 = 4h$$

Step 2: Divide both sides by the hourly rate to isolate h :

$$h = \frac{20}{4}$$

$$h = 5$$

Result: Micaela rented the bike for 5 hours.

Interpreting the Solution in Context

This calculation indicates that Micaela's rental duration was exactly five hours. The linear model aligns with real-world expectations: the total cost increases proportionally with the number of hours, starting with a fixed initial fee.

Additional considerations:

- Minimum rental time: Since the flat fee covers the initial cost regardless of duration, any rental must at least include the flat fee.
- Pricing implications: For shorter rentals, the cost is primarily influenced by the flat fee; for longer rentals, the hourly rate becomes more significant.
- Practicality: Understanding such pricing models helps customers plan their trips and budgets

accordingly.

Broader Applications of the Model

The problem exemplifies a common scenario in service-based industries where fixed and variable costs combine to determine total charges. Recognizing such structures is valuable in various contexts:

- Car rentals: Flat fee plus per-mile or per-hour charges
- Event spaces: Base fee plus hourly or per-day rates
- Consulting services: Fixed consultation fee plus hourly billing

In each case, translating the pricing into an algebraic model facilitates clear calculations and informed decision-making.

Additional Examples and Practice Problems

To deepen understanding, consider these similar problems:

1. Scenario: A gym charges a \$20 membership fee plus \$10 per class attended. If a member pays \$70 in total, how many classes did they attend?

Solution:

$$\backslash [70 = 20 + 10c \backslash]$$

$$\backslash [70 - 20 = 10c \backslash]$$

$$\backslash [50 = 10c \backslash]$$

$$\backslash [c = 5 \backslash]$$

Answer: The member attended 5 classes.

2. Scenario: A parking lot charges a \$5 flat fee plus \$3 per hour parked. If someone pays \$17, how many hours did they park?

Solution:

$$17 = 5 + 3h$$

$$17 - 5 = 3h$$

$$12 = 3h$$

$$h = 4$$

Answer: The vehicle was parked for 4 hours.

Limitations and Assumptions

While the model is straightforward, it's important to acknowledge potential limitations:

- Exactness: The calculation assumes Micaela rented exactly 5 hours; real-world scenarios might involve partial hours or additional fees.
- Time rounding: Some rental services round time to the nearest hour, affecting the total cost.
- Additional charges: Extra fees for damages, late returns, or equipment are not considered here.

Understanding these factors helps ensure accurate interpretation and application of the model.

Conclusion

The problem of determining how many hours Micaela rented a bike from Natasha's Bikes exemplifies the practical application of algebra in everyday life. By understanding the fixed plus variable nature of the pricing structure, setting up an algebraic equation, and solving it systematically, we find that Micaela rented the bike for 5 hours. This approach not only solves the specific problem but also provides a framework for analyzing similar scenarios across various industries. Recognizing and applying such models empower consumers and service providers alike to make informed decisions based on clear mathematical reasoning.

In summary:

- Natasha's Bikes charges a flat fee plus an hourly rate.
- Micaela paid a total of \$36.
- The algebraic model:

$$36 = 16 + 4h$$

- Solving yields:

$$h = 5$$

- Micaela rented the bike for 5 hours.

By mastering these concepts, readers can confidently approach and solve real-world problems involving fixed and variable costs, making smarter choices and better understanding the economics behind everyday transactions.

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