

Eddie Earned \$112 For 8 Hours Of Work. What Equation Can Be Written To Find Eddie's Hourly Wage? How

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When trying to determine someone's hourly wage based on their total earnings and hours worked, the problem often involves understanding the relationship between these quantities. In Eddie's case, he earned \$112 after working for 8 hours. To find his hourly wage, we need to establish an appropriate mathematical equation that relates total earnings, hours worked, and hourly wage. This article explores how to derive such an equation step-by-step, discusses different methods to solve for the hourly wage, and provides practical examples to clarify the process.

Understanding the Relationship Between Total Earnings, Hours Worked, and Hourly Wage

The Basic Concept

The core idea behind calculating hourly wage is that it is the amount earned per hour of work. If we denote:

- W as the hourly wage,
- T as the total earnings,
- H as the total hours worked,

then the relationship can be expressed as:

$$T = W \times H$$

This formula states that total earnings are equal to the hourly wage multiplied by the number of hours worked.

Applying to Eddie's Situation

In Eddie's case:

- Total earnings ($T = \$112$)
- Hours worked ($H = 8$)

Our goal is to find the hourly wage (W).

Formulating the Equation to Find Eddie's Hourly Wage

Step 1: Identify Known Values

The known values are:

- Total earnings: \$112
- Hours worked: 8 hours

Step 2: Write the General Equation

Using the basic relationship:

$$T = W \times H$$

Substitute the known values:

$$112 = W \times 8$$

Step 3: Rearrange the Equation to Solve for W

To find (W) , divide both sides of the equation by 8:

$$W = \frac{112}{8}$$

This simple algebraic step isolates (W) , giving the hourly wage directly.

Methods to Calculate Eddie's Hourly Wage

Method 1: Direct Division

The most straightforward method is to divide the total earnings by the total hours worked:

$$W = \frac{T}{H}$$

Applying to Eddie:

$$W = \frac{112}{8} = 14$$

Eddie's hourly wage is \$14 per hour.

Method 2: Using Algebraic Equations

Alternatively, setting up the equation:

$$112 = W \times 8$$

and solving for (W) by dividing both sides by 8:

$$W = \frac{112}{8}$$

This approach is useful when dealing with more complex problems involving multiple variables or additional data.

Method 3: Using Proportions (Optional)

If the problem involves proportional relationships, one can set up a proportion:

$$\frac{\text{Earnings}_1}{\text{Hours}_1} = \frac{\text{Earnings}_2}{\text{Hours}_2}$$
but in Eddie's case, since we only have one data point, direct division suffices.

Understanding the Importance of the Equation

Why Is Formulating an Equation Important?

- It provides a clear framework to solve for unknown variables.
- It can be adapted for more complex problems involving multiple variables.
- It reinforces understanding of the relationship between earnings, hours, and wages.

Real-World Applications

- Calculating wages for part-time or freelance work.
- Determining pay rates based on total earnings and hours worked.
- Comparing different jobs or pay structures.

Additional Examples and Practice Problems

Example 1: Different Earnings and Hours

Suppose someone earned \$150 after working 10 hours. What is their hourly wage?

Solution:

$$W = \frac{150}{10} = \$15 \text{ per hour}$$

Example 2: Unknown Earnings with Known Wage

If Eddie's hourly wage is \$14, how much did he earn after working 8 hours?

Solution:

$$T = W \times H = 14 \times 8 = \$112$$

Practice Problem:

A worker earns \$200 after working 5 hours. What is their hourly wage?

Answer:

$$W = \frac{200}{5} = \$40 \text{ per hour}$$

Conclusion: Summarizing the Key Points

To find Eddie's hourly wage, the fundamental equation to use is:

$$W = \frac{T}{H}$$

Where:

- T is the total earnings (\$112),
- H is the hours worked (8 hours),
- W is the hourly wage (to be calculated).

Applying the division:

$$W = \frac{112}{8} = \$14$$

This simple yet powerful equation allows anyone to determine hourly wages quickly and accurately. Understanding how to set up and manipulate this equation is essential for solving various real-world problems related to earnings and work hours. Whether for personal finance, employment negotiations, or educational purposes, mastering this fundamental relationship provides a solid foundation in basic algebra and financial literacy.

Frequently Asked Questions

What is the equation to find Eddie's hourly wage based on his total earnings and hours worked?

The equation is: Hourly Wage = Total Earnings ÷ Hours Worked. In this case, it would be \$112 ÷ 8 hours.

How do you calculate Eddie's hourly wage from his total earnings and hours worked?

Divide the total amount earned by the number of hours worked: \$112 ÷ 8 hours = \$14 per hour.

What mathematical operation is used to determine Eddie's

hourly wage?

Division is used to find the hourly wage by dividing total earnings by total hours worked.

If Eddie earns \$112 for 8 hours, what is his hourly wage formula?

Hourly Wage = $112 \div 8$, which equals \$14 per hour.

Can you write an algebraic equation to represent Eddie's earnings and wage?

Yes, if W represents hourly wage, then $8 \times W = 112$. Solving for W gives $W = 112 \div 8$.

Why is dividing total earnings by hours worked the correct method to find the hourly wage?

Because hourly wage is defined as the amount earned per hour, so dividing total earnings by total hours gives the rate per hour.

What is the value of Eddie's hourly wage based on the given information?

Eddie's hourly wage is \$14 per hour.

Additional Resources

Eddie Earned \$112 For 8 Hours Of Work. What Equation Can Be Written To Find Eddie's Hourly Wage? How

Understanding how to determine an individual's hourly wage from total earnings and hours worked is a fundamental concept in basic algebra and financial literacy. In this context, Eddie's scenario offers an excellent real-world example to explore the mathematical principles involved, specifically the derivation and application of a simple linear equation. This article delves into the detailed process of formulating this equation, interpreting its components, and understanding its practical implications.

Introduction: The Significance of Calculating Hourly Wages

Calculating hourly wages is a crucial skill for employees, employers, and financial planners alike. It allows individuals to assess their earning rate, compare job offers, or analyze work productivity. In

Eddie's case, knowing how to determine his hourly wage from total earnings and hours worked reveals insights into his income structure and can inform future employment or negotiation strategies.

This scenario underscores the importance of translating real-world data into mathematical expressions — an essential step in problem-solving across various disciplines. By establishing an equation that accurately models Eddie's earnings, we can also develop a general method applicable to similar situations, fostering a deeper understanding of basic algebraic concepts.

Understanding the Variables: Breaking Down the Problem

Before constructing the equation, it is vital to identify and comprehend the variables involved:

- Total Earnings (E): The total amount of money Eddie earned, which is \$112.
- Hours Worked (H): The total number of hours Eddie worked, which is 8 hours.
- Hourly Wage (w): The rate of pay per hour, which is the unknown we seek to find.

Expressed mathematically:

- E = total earnings
- H = total hours worked
- w = hourly wage (unknown)

The goal is to find a relationship that links these variables, enabling us to solve for the hourly wage.

Formulating the Mathematical Equation

The core principle underlying this problem is straightforward: the total earnings are equal to the hourly wage multiplied by the number of hours worked. This relationship can be expressed mathematically as:

$$E = w \times H$$

This equation encapsulates the total earnings as a product of the hourly rate and hours worked. Rearranged, it can be used to solve for any of the variables if the others are known.

Applying this to Eddie's scenario:

- E = 112 dollars
- H = 8 hours
- w = ?

Thus, the specific equation becomes:

$$112 = w \times 8$$

This simple linear equation forms the foundation for calculating Eddie's hourly wage.

Deriving the Equation to Find Eddie's Hourly Wage

To isolate the unknown variable w (Eddie's hourly wage), we need to manipulate the equation algebraically. Since the equation is a basic multiplication equation, division is used to solve for w :

$$w = E \div H$$

This formula states that the hourly wage is equal to total earnings divided by total hours worked.

Applying Eddie's numbers:

$$w = 112 \div 8$$

Calculating this division yields:

$$w = 14$$

Therefore, Eddie's hourly wage is \$14 per hour.

This straightforward derivation exemplifies a fundamental algebraic principle: solving for an unknown in a linear equation involves inverse operations, here division.

Detailed Explanation of the Equation Components

1. The Equation: $E = w \times H$

- E (Total Earnings): Represents the total amount earned over a specified period. In Eddie's case, it's \$112 for 8 hours.
- w (Hourly Wage): The rate of pay per hour, which we aim to determine.
- H (Hours Worked): The total time spent working; 8 hours in Eddie's scenario.

This equation is based on the principle that total earnings are proportional to hours worked, assuming a constant wage rate.

2. Solving for the Unknown:

- To find the hourly wage, w , we rearrange the equation:

$$w = E \div H$$

- This rearrangement relies on the properties of equality and inverse operations in algebra.

3. Practical Interpretations:

- Knowing w allows Eddie to compare his earnings to other jobs or to evaluate whether his current pay rate aligns with industry standards.
- It also enables calculations of projected earnings for different hours worked, assisting in planning and decision-making.

Extending the Concept: Generalizing the Equation

The formula and approach used in Eddie's scenario can be generalized to a wide range of situations involving linear relationships between total earnings, hourly rates, and hours worked. The general form is:

$$\text{Total Earnings} = \text{Hourly Rate} \times \text{Hours Worked}$$

or

$$E = w \times H$$

Applications include:

- Calculating wages for different shifts or projects.
- Estimating total income based on expected hours and pay rate.
- Analyzing the impact of working extra hours or reducing hours.

Example:

Suppose someone earns \$150 after working 10 hours. To find their hourly wage:

$$w = 150 \div 10 = \$15/\text{hour}$$

Similarly, if someone knows their hourly wage and hours, they can determine total earnings:

$$E = w \times H$$

Practical Implications and Limitations

While the equation is straightforward, real-world scenarios often involve complexities:

- Variable Wages: Some jobs pay different rates depending on hours worked (overtime, shift differentials).
- Additional Compensation: Bonuses, tips, or commissions are not accounted for in this basic model.
- Taxes and Deductions: Actual take-home pay may differ after deductions, which are not modeled here.
- Part-Time or Contract Work: In such cases, the relationship may be more complex.

Despite these limitations, the fundamental equation remains a vital tool for initial calculations and understanding basic pay structures.

Conclusion: The Power of Simple Equations in Financial Literacy

The scenario of Eddie earning \$112 for 8 hours of work exemplifies how simple algebraic equations can provide valuable insights into earnings and wages. By formulating the basic relationship $E = w \times H$, and solving for the unknown w , we can efficiently determine Eddie's hourly rate, which in this case is \$14 per hour.

This exercise underscores the importance of understanding how to translate real-world problems into mathematical expressions, enabling individuals to make informed decisions about their finances, employment opportunities, and productivity analysis. Mastery of such fundamental equations equips students, workers, and professionals with essential tools to navigate economic and labor-related challenges confidently.

In summary, the ability to write and manipulate equations like $w = E \div H$ not only provides clarity in specific cases like Eddie's but also lays the groundwork for a broader understanding of income calculations and financial decision-making in everyday life and professional contexts.

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