

Mark Earns \$8 Per Hour At A Store. Part A: Write An Equation For This Situation. Part B: Create A Table.

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Introduction

Understanding how to represent real-world scenarios mathematically is essential, especially when it comes to calculating earnings based on hourly wages. In this article, we will explore a common situation involving Mark, who earns \$8 per hour at a store. We will develop an algebraic equation to model his earnings and then create a comprehensive table to visualize how his total earnings increase with the number of hours worked. Whether you're a student learning about linear functions or someone interested in budgeting, this guide will help clarify these concepts in an accessible way.

Part A: Writing an Equation for Mark's Earnings

Understanding the Situation

Before constructing an equation, it's important to understand the key details:

- Mark earns a fixed amount of money for each hour worked.
- The rate of pay is \$8 per hour.
- The total amount earned depends on the number of hours Mark works.

Defining Variables

To write a clear and useful equation, we must identify the variables:

- Let h represent the number of hours Mark works.
- Let E represent the total earnings in dollars.

Formulating the Equation

Given the above information, the total earnings can be calculated by multiplying the number of hours worked by the hourly wage:

- $E = 8 \times h$

This is a linear equation because the total earnings increase by a fixed amount (eight dollars) for each additional hour Mark works.

Key Points About the Equation

- The coefficient (8) indicates Mark's hourly wage.
- The variable h can be any non-negative number (since you can't work negative hours).
- The equation models a straight-line relationship between hours worked and earnings.

Part B: Creating a Table to Visualize Earnings

Purpose of the Table

Constructing a table helps in understanding how total earnings grow with increasing hours. It allows for quick reference and can be useful for budgeting or planning work schedules.

Choosing Values for Hours Worked

To illustrate the relationship clearly, select a range of hours:

- Typically, start from 0 hours (no work, no earnings).
- Include common work durations such as 1, 2, 4, 8, 10, 12, and 15 hours.
- You can extend the table further depending on needs.

Calculating Earnings for Selected Hours

Using the equation $E = 8 \times h$, compute total earnings for each hour value:

- For example, if $h = 4$, then $E = 8 \times 4 = \$32$.
- Repeat for each selected value.

Constructed Earnings Table

Hours Worked (h)	Total Earnings (E) in Dollars
0	\$0
1	\$8
2	\$16
4	\$32
8	\$64
10	\$80
12	\$96
15	\$120

Interpreting the Table

- The table shows a direct, proportional relationship.
- For every additional hour worked, Mark earns an extra \$8.
- The table helps visualize how earnings accumulate over different work durations.

Additional Insights and Applications

Understanding Linear Functions

This scenario exemplifies a simple linear function where the total earnings increase linearly as a function of hours worked:

- Linear functions have the form $E = m \times h + b$, where:
- m is the rate of change (here, \$8 per hour).
- b is the y-intercept (here, 0, since earning zero dollars when no hours are worked).

Real-World Applications

Knowing how to model earnings helps in:

- Budgeting and financial planning.
- Estimating weekly or monthly income based on work hours.
- Making informed decisions about work schedules.

Extensions of the Model

- Overtime Pay: If Mark earns more than \$8 per hour after a certain number of hours, the equation can be modified to reflect different rates.
- Deductions: Incorporate taxes or deductions to find net earnings.
- Part-Time vs. Full-Time: Adjust the model based on different work durations.

Conclusion

By understanding how to formulate an equation based on Mark's hourly wage, learners can better grasp the concept of linear relationships in real-life situations. The simple equation $E = 8 \times h$ effectively models his earnings, providing a foundation for more complex financial calculations. The accompanying table offers a visual tool to comprehend how earnings grow with additional hours worked, making this an essential skill for students, employees, and anyone interested in personal finance.

Remember, whether you're calculating pay, budgeting, or analyzing data, translating real-world scenarios into mathematical equations and tables is a powerful way to enhance understanding and make informed decisions.

Frequently Asked Questions

What is the equation that represents Mark's earnings based on the hours he works at \$8 per hour?

The equation is $E = 8h$, where E represents earnings in dollars and h represents hours worked.

How can I create a table to show Mark's earnings for different hours worked?

Choose various values for hours worked (e.g., 0, 1, 2, 3, 4) and calculate earnings using $E = 8h$ for each, then organize these into a table with 'Hours Worked' and 'Earnings' columns.

If Mark works 5 hours, how much money does he earn? How is this shown in the table?

At 5 hours, Mark earns $E = 8 \times 5 = \$40$. In the table, under 5 hours, the earnings would be listed as \$40.

What are some example entries for the table showing Mark’s earnings for hours worked from 0 to 4?

Hours Worked	Earnings
0	\$0
1	\$8
2	\$16
3	\$24
4	\$32

Why is creating a table helpful in understanding Mark's earnings based on hours worked?

A table helps visualize how earnings increase proportionally with hours worked, making it easier to understand and compare different scenarios quickly.

Additional Resources

Mark earns \$8 per hour at a store is a common scenario that offers a valuable opportunity to explore basic algebraic concepts and data organization skills. This situation not only illustrates fundamental mathematical principles but also helps in developing problem-solving abilities and understanding real-world applications of equations and tables. In this article, we will delve into creating an appropriate algebraic equation for Mark’s earnings, followed by constructing a detailed table to visualize his income over different hours worked.

Part A: Writing an Equation for Mark’s Earnings

Understanding how to translate a real-world scenario into a mathematical equation is a crucial skill. In Mark’s case, his earnings are directly proportional to the number of hours he works, with a fixed rate of pay.

Step 1: Identify Known Variables

- Hourly wage: \$8 per hour
- Number of hours worked: Let's denote this as h
- Total earnings: Let's denote this as E

Step 2: Understand the Relationship

Since Mark earns a fixed rate per hour, his total earnings are calculated by multiplying his hourly wage by the number of hours worked. This is a linear relationship, which can be expressed with a simple algebraic equation.

Step 3: Write the Equation

The equation representing Mark's total earnings based on hours worked is:

$$E = 8h$$

Here:

- E is the total earnings in dollars
- h is the number of hours worked

This equation indicates that for any number of hours Mark works, his total pay will be eight times that number of hours.

Additional Considerations

- If Mark works zero hours, his earnings are zero ($E = 8 \cdot 0 = 0$).
- If Mark works 10 hours, his earnings would be $E = 8 \cdot 10 = \$80$.
- The equation is linear and directly proportional, making it simple to evaluate earnings for any given hours.

Part B: Creating a Table to Visualize Earnings

Constructing a table allows us to see how Mark's earnings change with different hours worked. This approach provides a clear, visual understanding of the linear relationship established by the equation.

Step 1: Decide on the Range of Hours

For a comprehensive view, select a range of hours that reflect typical work scenarios:

- From 0 hours to 10 hours
- Including fractional hours for more detailed analysis (e.g., 1.5 hours, 2.5 hours)

Step 2: Calculate Corresponding Earnings

Using the equation $E = 8h$, compute the earnings for each selected hour value.

Sample Table of Mark’s Earnings

Hours Worked (h)	Total Earnings (E) in Dollars
0	\$0
1	\$8
2	\$16
3	\$24
4	\$32
5	\$40
6	\$48
7	\$56
8	\$64
9	\$72
10	\$80
1.5	\$12
2.5	\$20
3.5	\$28
4.5	\$36
5.5	\$44

This table demonstrates the straightforward linear relationship. For each additional hour, Mark earns an extra \$8.

Features and Benefits of this Table

- Clarity: Easily visualizes how earnings increase with hours worked.
- Flexibility: Can be extended to any number of hours, including fractional hours.
- Practicality: Useful for Mark to estimate his earnings for varying work schedules.
- Educational Value: Helps students understand the concept of proportional relationships and graphing.

Additional Insights and Applications

Creating equations and tables for real-world situations like Mark’s earnings is fundamental in various fields, including finance, economics, and everyday budgeting. These tools allow individuals to predict income, plan work hours, and understand the impact of different work scenarios.

Pros and Cons of Using Equations and Tables

Pros:

- Accuracy: Precise calculations based on clear formulas.
- Efficiency: Quickly evaluate earnings for multiple scenarios.
- Visualization: Tables help in visual understanding and comparison.
- Foundation for Graphing: Equations and tables are essential steps toward plotting graphs for data analysis.

Cons:

- Limited Complexity: Simple equations like $E=8h$ don't account for taxes, deductions, or overtime pay.
- Assumption of Constant Rate: The model assumes Mark's hourly rate remains the same, which might not be the case in real employment situations.
- Potential for Errors: Manual calculations can lead to mistakes; digital tools can mitigate this.

Conclusion

The scenario of Mark earning \$8 per hour at a store provides a clear example of how to formulate a simple algebraic equation and create a corresponding data table. The equation $E = 8h$ succinctly captures the linear relationship between hours worked and earnings, serving as a fundamental concept in algebra. The table further enhances understanding by illustrating actual earnings for various hours, including fractional values, which mimics real-world pay scenarios. These mathematical tools are invaluable not only in academic settings but also in practical life, empowering individuals to make informed decisions about work schedules and earnings. Whether used for educational purposes or personal financial planning, mastering the creation and interpretation of equations and tables remains an essential skill that bridges the gap between abstract mathematics and everyday life.

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