# Tomatoes Cost $1.19 Per Pound. Which Equation Best Represents Y, The Total Cost Of X Pounds Of Tomatoes?ResponsesA

**Tomatoes Cost $1.19 Per Pound. Which Equation Best Represents Y, The Total Cost Of X Pounds Of Tomatoes? Responses A**

Understanding how to translate real-world scenarios into mathematical equations is a fundamental skill in algebra and everyday problem-solving. In this article, we will explore how to determine the total cost of purchasing a certain number of pounds of tomatoes when the price per pound is known. Specifically, we will analyze the scenario where tomatoes cost $1.19 per pound and discuss how to formulate the correct equation to represent the total cost based on the weight in pounds.

## Understanding the Scenario: Tomatoes Pricing and Total Cost

Before delving into the equations, it is essential to grasp the basics of unit pricing and total cost calculations.

### Unit Price and Its Significance

- The unit price refers to the cost per individual unit of an item—in this case, per pound of tomatoes.
- Knowing the unit price allows for straightforward calculation of total cost based on the quantity purchased.

### Total Cost Calculation

- The total cost (Y) depends on both the unit price and the quantity purchased (X).
- The general formula for total cost when unit price is constant is:

$$
\text{Total Cost} = (\text{Unit Price}) \times (\text{Quantity})
$$

- Here, the unit price is $1.19 per pound, and the quantity is X pounds.

## Formulating the Equation for Total Cost

When translating this scenario into an equation, we define:

- Y as the total cost of the tomatoes in dollars.
- X as the number of pounds of tomatoes purchased.

Given the unit price of $1.19 per pound, the most straightforward and accurate equation is:

$$
Y = 1.19 \times X
$$

This equation states that to find the total cost (Y), multiply the weight in pounds (X) by the price per pound ($1.19).

# Why is Y = 1.19 × X the Best Equation?

Many students and individuals unfamiliar with algebra might encounter multiple options for equations. To understand why Y = 1.19 × X is correct, let's analyze the typical alternatives and their correctness.

## Common Misconceptions and Incorrect Equations

- Y = X + 1.19: This suggests adding the price to the weight, which doesn't make sense for calculating total cost.
- Y = 1.19 + X: Similar to the previous, it adds the unit price to weight; incorrect for total cost calculation.
- Y = 1.19 / X: Implies dividing the price by the weight; incorrect unless the context specifies a different relationship.
- Y = X / 1.19: Implies the total cost is the weight divided by the unit price, which reverses the relationship.

## Correct Equation Explanation

- Since total cost is directly proportional to the weight, the multiplication model applies.
- The unit price acts as a constant multiplier.
- The equation Y = 1.19 × X accurately models the total cost for any given weight.

# Visualizing the Equation and Its Graph

Graphical representation helps in understanding how total cost varies with weight.

## Plotting the Equation

- The graph of Y = 1.19 × X is a straight line passing through the origin (0,0).
- The slope of the line is 1.19, indicating that for each additional pound, the total cost increases by $1.19.

### Interpreting the Graph

- When X = 0 (no pounds purchased), Y = 0 (no cost).
- When X = 10 pounds, Y = 1.19 × 10 = $11.90.
- The graph's steepness reflects the price per pound.

## Practical Applications of the Equation

Knowing the correct equation allows consumers and vendors to perform various calculations.

### Estimating Total Cost

- For any given weight, simply multiply by $1.19.

Example:
- How much do 5 pounds of tomatoes cost?
- $Y = 1.19 \times 5 = \$5.95$

### Determining How Much to Spend

- If a shopper has a budget, they can determine the maximum number of pounds they can buy.

Example:
- Budget = $20
- Find X such that $Y = 1.19 \times X \leq 20$
- $X \leq \frac{20}{1.19} \approx 16.81$
- So, they can buy up to 16.81 pounds of tomatoes with $20.

### Setting Up a Purchase Equation

- If the total cost Y is fixed, and you want to find the weight X:

$$
X = \frac{Y}{1.19}
$$

## Additional Considerations and Variations

Sometimes, pricing may involve discounts, taxes, or different units, leading to variations in the equations.

### Including Taxes or Additional Charges

- If there is a sales tax, the total cost becomes:

$$
Y = 1.19 \times X \times (1 + \text{tax rate})
$$

- For example, with a 7% sales tax:

$$
Y = 1.19 \times X \times 1.07
$$

### Bulk Purchasing and Discounts

- Sometimes, stores offer discounts for buying in bulk, which can modify the unit price or introduce a fixed discount amount.

## Summary: The Correct Equation and Its Significance

In conclusion, the best equation to represent the total cost (Y) of X pounds of tomatoes priced at $1.19 per pound is:

$$
Y = 1.19 \times X
$$

This linear equation is simple, accurate, and directly models the relationship between weight and total cost. It is fundamental in everyday shopping, budgeting, and understanding how unit prices influence total expenditure.

### Key Takeaways

- The total cost is proportional to the weight of tomatoes purchased.
- The unit price ($1.19) acts as a constant multiplier.
- The equation allows for quick calculations of costs for any weight.
- Understanding this relationship helps in making informed purchasing decisions and managing budgets effectively.

## Final Thoughts

Mastering how to formulate and interpret such equations is an essential skill that extends beyond shopping. It lays the foundation for understanding more complex algebraic relationships and problem-solving scenarios. Whether you're buying produce, calculating expenses, or analyzing data, recognizing the role of equations like $Y = 1.19 \times X$ empowers you to approach problems logically and efficiently.

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If you have any further questions about algebraic equations, pricing strategies, or related topics, feel free to explore additional resources or consult your math instructor for personalized guidance.

# Frequently Asked Questions

## What is the correct equation to calculate the total cost (Y) of purchasing X pounds of tomatoes at $1.19 per pound?

The equation is Y = 1.19 X.

## If you buy 3 pounds of tomatoes at $1.19 per pound, what is the total cost?

Using the equation Y = 1.19 X, for X = 3, total cost Y = 1.19 3 = $3.57.

## Which of the following equations correctly models the total cost of tomatoes at $1.19 per pound?

Y = 1.19 X correctly models the total cost, where X is the number of pounds.

## How does the equation Y = 1.19 X help in budgeting for tomato purchases?

It allows you to calculate the total cost based on the weight you plan to buy, helping you budget accurately.

## If the total cost of tomatoes is $11.90, how many pounds did you buy?

Using Y = 1.19 X, solve for X: X = Y / 1.19 = 11.90 / 1.19 = 10 pounds.

# Additional Resources

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In the world of grocery shopping and culinary planning, understanding how prices translate into total costs is essential. When purchasing produce like tomatoes, consumers often wonder how to calculate the total expense based on weight. Given the price of tomatoes at $1.19 per pound, the question arises: which mathematical equation best represents the total cost, denoted as Y, when buying a certain number of pounds, denoted as X? This article explores this problem in depth, examining the fundamental principles of linear equations in relation to grocery pricing, and analyzing the options to identify the most accurate mathematical representation.

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Understanding the Basics: Price per Pound and Total Cost

Before delving into the specifics of the equation, it is important to understand the core concepts involved:

- Price per Pound ($1.19): This is the unit rate at which tomatoes are sold. It indicates that for every pound of tomatoes purchased, the total cost increases by $1.19.

- Total Cost (Y): The overall amount spent on tomatoes, which depends on the weight purchased, represented as X pounds.

- Weight (X): The number of pounds of tomatoes bought. This could be any value, from a fraction of a pound to several pounds.

Given these definitions, the problem reduces to finding an equation that relates the total cost Y to the weight X, based on the given unit price.

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The Mathematical Model: Linear Relationship in Grocery Pricing

Most grocery pricing for items sold by weight follows a linear relationship, meaning the total cost increases proportionally with the weight purchased. This is expressed mathematically as:

$$ Y = \text{(unit price)} \times X $$

where:

- $ Y $ is the total cost,
- $ X $ is the weight in pounds,
- The unit price is $1.19 per pound.

This simple formula captures the essence of the pricing mechanism: for each additional pound, the total cost increases by $1.19.

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Analyzing the Options: Which Equation Fits?

Suppose multiple choice options are provided to represent the relationship between total cost $ Y $ and weight $ X $. The options can be summarized as follows:

- Option A: $ Y = 1.19 + X $
- Option B: $ Y = 1.19 \times X $
- Option C: $ Y = 1.19 - X $
- Option D: $ Y = X / 1.19 $

Let’s analyze each to determine which accurately models the situation.

Option A: $ Y = 1.19 + X $

This equation suggests that the total cost is calculated by adding the weight $ X $ directly to the fixed amount of $1.19. However, this does not make sense in the context of pricing per pound because adding pounds directly to a fixed cost ignores the proportional relationship. For example, if $ X = 2 $ pounds, this formula would give:

$$ Y = 1.19 + 2 = 3.19 $$

which implies a total cost of $3.19. But at $1.19 per pound, 2 pounds should cost:

$$ 2 \times 1.19 = 2.38 $$

Therefore, Option A does not correctly model the situation.

Option B: $Y = 1.19 \times X$

This equation correctly reflects the linear relationship between weight and total cost. It states that the total cost is the unit price multiplied by the number of pounds. For example, for 3 pounds:

$$ Y = 1.19 \times 3 = 3.57 $$

which makes sense because:

$$ 3 \times 1.19 = 3.57 $$

This matches the expected total cost.

Option C: $Y = 1.19 - X$

This formula suggests subtracting the weight from the unit price, which does not align with how pricing works. It would imply that buying more pounds decreases the total cost, which is illogical. At any positive $X$, the total cost would decrease as you buy more, which contradicts basic pricing principles.

For example, at $X = 2$:

$$ Y = 1.19 - 2 = -0.81 $$

a negative total cost, which is impossible in this context.

Option D: $Y = X / 1.19$

This suggests dividing the weight by the unit price to get total cost, which is incorrect. Dividing the weight by the price would give a measure of how many "pounds per dollar" you get, not the total price.

For example, for $X = 2$:

$$ Y = 2 / 1.19 \approx 1.68 $$

which does not represent the total cost of 2 pounds at $1.19 per pound.

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The Correct Equation: A Clear Mathematical Representation

Based on the above analysis, the equation that best models the total cost of tomatoes given the price per pound is:

$$ \boxed{Y = 1.19 \times X} $$

This equation aligns with the principles of proportional relationships and is consistent with standard grocery pricing.

Real-World Application and Implications

Understanding the correct equation has practical significance:

- Budgeting: Consumers can quickly estimate their total expenses based on the weight of produce they intend to buy.

- Pricing Transparency: Recognizing the linear relationship helps shoppers verify receipts and ensure they are charged correctly.

- Culinary Planning: Chefs and meal preparers can determine ingredient costs in advance, optimizing their grocery shopping.

- Educational Importance: This simple example serves as a foundational illustration of linear equations, which are fundamental in algebra and real-world problem-solving.

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Additional Considerations

While the basic model assumes a constant price per pound, some factors can influence the actual cost:

- Bulk discounts: Sometimes, buying in larger quantities may reduce the per-pound price, leading to a different equation.

- Price fluctuations: Market conditions can cause the price per pound to vary over time.

- Additional fees: Some stores may include taxes or other charges, adding complexity to the simple linear model.

However, for standard pricing at $1.19 per pound, the linear equation $Y = 1.19 \times X$ remains the most accurate and straightforward representation.

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Conclusion

In summary, when purchasing tomatoes priced at $1.19 per pound, the total cost $Y$ for buying $X$ pounds can be accurately modeled by the equation:

$$Y = 1.19 \times X$$

This linear relationship is intuitive, mathematically sound, and directly applicable to everyday shopping scenarios. Recognizing this fundamental principle not only enhances financial literacy but also empowers consumers to make more informed decisions. Whether you're budgeting for a family meal or analyzing pricing strategies, understanding the correct mathematical model is crucial. Remember, in the realm of linear pricing, the total cost always equals the unit price multiplied by the quantity purchased.

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