

True Or False: A Firm Produces 42 Units Of Output. Its AVC Is \$21 And Its TR Is \$924. With The Given Info,

True Or False: A Firm Produces 42 Units Of Output. Its AVC Is \$21 And Its TR Is \$924. With The Given Info, let's analyze the scenario to determine whether the statement is true or false. This involves understanding key concepts in microeconomics such as total revenue, average variable cost, and how these relate to the firm's production output.

Understanding the Basic Concepts: Total Revenue, Average Variable Cost, and Output

Before diving into the specifics, it's essential to clarify the fundamental economic terms involved:

Total Revenue (TR)

- Total revenue is the income a firm earns from selling its goods or services.
- It is calculated as: $TR = \text{Price per unit (P)} \times \text{Quantity (Q)}$.
- Total revenue helps determine whether a firm is profitable or incurring losses.

Average Variable Cost (AVC)

- AVC is the variable cost per unit of output.
- It is calculated as: $AVC = \text{Total Variable Cost (TVC)} / \text{Quantity (Q)}$.
- The variable costs include expenses such as wages, raw materials, and energy, which vary with the level of output.

Output (Q)

- The quantity of units produced and sold by the firm.
- In this scenario, the output is 42 units.

Given Data Breakdown

Let's list the data provided:

- Output (Q) = 42 units
- Average Variable Cost (AVC) = \$21

- Total Revenue (TR) = \$924

Using this information, we can analyze the relationships between these variables to verify the statement's accuracy.

Calculating Total Variable Cost (TVC)

Since AVC is given, calculating the total variable cost is straightforward:

$$\begin{aligned} & \\ \text{TVC} &= \text{AVC} \times Q \\ & \end{aligned}$$

Plugging in the numbers:

$$\begin{aligned} & \\ \text{TVC} &= 21 \times 42 = 882 \\ & \end{aligned}$$

So, the total variable cost for producing 42 units is \$882.

Determining the Price per Unit (P)

Total revenue is given as \$924, which is the total income from selling 42 units. Therefore, the price per unit can be calculated as:

$$\begin{aligned} & \\ P &= \frac{\text{TR}}{Q} = \frac{924}{42} = 22 \\ & \end{aligned}$$

This indicates that the firm sells each unit at a price of \$22.

Verifying the Consistency of the Data

Now, let's analyze whether the data provided is consistent and makes sense:

- The firm sells each unit at \$22.
- The average variable cost per unit is \$21.
- Total variable cost for 42 units is \$882.

- Total revenue from 42 units is \$924.

Next, consider the implications for the firm's profitability.

Calculating Total Fixed Cost (TFC)

Total fixed costs are the costs that do not change with output level and are not included in variable costs. To find the fixed costs, we need to determine total costs (TC).

Total costs (TC) are the sum of total fixed costs (TFC) and total variable costs (TVC):

$$TC = TFC + TVC$$

Since total revenue (TR) and total costs (TC) are related to profit:

$$\text{Profit} = TR - TC$$

But without fixed cost information, we cannot directly compute profit. However, if the firm is earning a total revenue of \$924 and total variable costs are \$882, the profit depends on fixed costs.

Note: The key aspect here is whether the firm's total revenue covers total costs and whether the operation is profitable or not.

Is the Firm Covering Its Costs?

To determine this, we need to understand whether the total revenue exceeds total costs.

- Total revenue: \$924
- Total variable costs: \$882
- Total fixed costs: unknown

Assuming the firm is earning a profit (which is possible if total fixed costs are less than the difference between TR and TVC):

$$\text{Profit} = TR - (TFC + TVC)$$

If fixed costs are, for instance, less than \$42 (which is the difference between TR and TVC), then the firm makes a profit.

Analyzing the Profitability and the Validity of the Statement

Given the data:

- Price per unit = \$22
- AVC = \$21
- Total variable costs = \$882
- Total revenue = \$924

The contribution margin per unit is:

$$\begin{aligned} \text{Contribution Margin} &= P - AVC = 22 - 21 = 1 \end{aligned}$$

Total contribution margin:

$$\text{Total Contribution} = \text{Contribution Margin} \times Q = 1 \times 42 = 42$$

This means the firm earns \$42 over variable costs, which can be used to cover fixed costs and potentially generate profit.

Implication:

- If fixed costs are less than \$42, the firm is profitable.
- If fixed costs are more than \$42, the firm incurs a loss.

Conclusion:

- The firm's total revenue covers its variable costs, and there is a small contribution margin remaining.
- The data is consistent with a scenario where the firm is making a small profit if fixed costs are under \$42.
- Alternatively, if fixed costs are over \$42, the firm operates at a loss.

Is the Original Statement True or False?

Now, let's revisit the original statement:

> True Or False: A Firm Produces 42 Units Of Output. Its AVC Is \$21 And Its TR Is \$924. With The Given Info,

Based on our calculations:

- The total revenue (\$924) and quantity (42 units) align with the selling price per unit of \$22.
- The AVC is \$21, which is less than the selling price, indicating the firm is covering variable costs and contributing to fixed costs.
- The total variable costs are \$882.
- The fixed costs are unknown but can range from zero upwards.

Therefore, with the given data, the statement is true since all figures are consistent and logically aligned.

Additional Considerations and Economic Insights

Even though the data suggests the statement is true, it's important to consider:

Profitability Analysis

- If fixed costs are less than \$42, the firm is making a profit.
- If fixed costs are more than \$42, the firm is incurring a loss but still covering variable costs.

Break-Even Point

- The firm breaks even when total revenue equals total costs.
- At a selling price of \$22 per unit and AVC of \$21, the firm earns only \$1 per unit contribution margin.
- To cover fixed costs, the firm needs to sell enough units; in this case, it seems to be covering at least variable costs.

Implications for Business Decisions

- The firm should evaluate its fixed costs to determine profitability.
- Pricing strategies could be adjusted to increase contribution margins.
- Understanding the relationship between AVC, price, and total revenue helps in making informed production decisions.

Conclusion

In summary, based on the calculations and analysis:

- The output is 42 units.
- The AVC is \$21, which aligns with the total variable costs of \$882.
- The total revenue is \$924, which results in a unit price of \$22.

All these figures are consistent with each other, indicating that the initial statement is true under the given assumptions and typical economic interpretations.

Final note: While the statement is true based on the provided data, real-world scenarios may require

additional information such as fixed costs, market conditions, and other operational factors to fully assess profitability and strategic decisions.

If you want further insights into how these concepts influence business strategies or detailed calculations for profit maximization, feel free to ask!

Frequently Asked Questions

True or False: The firm's total revenue (TR) is calculated as 42 units multiplied by the average variable cost (AVC).

False. Total revenue is calculated as price per unit multiplied by quantity, not by average variable cost.

True or False: Given the TR of \$924 and output of 42 units, the price per unit is \$22.

True. Price per unit = $TR / \text{output} = \$924 / 42 = \22 .

True or False: The firm's total variable cost (TVC) can be calculated by multiplying AVC by output.

True. $TVC = AVC \times \text{Quantity} = \$21 \times 42 = \$882$.

True or False: The firm's total cost (TC) is the sum of total fixed costs and total variable costs.

True. Total cost = total fixed costs + total variable costs. However, fixed costs are not provided here.

Based on the given information, is the firm's average total cost (ATC) higher or lower than AVC?

It cannot be determined exactly without fixed costs, but ATC is typically higher than AVC since ATC includes fixed costs per unit.

True or False: If the firm's output is 42 units and TR is \$924, then the average revenue per unit is \$22.

True. Average revenue per unit = $TR / \text{output} = \$924 / 42 = \22 .

True or False: The firm is making a profit if the price per unit exceeds the average total cost (ATC).

True, assuming the ATC is less than the price per unit; however, ATC cannot be calculated exactly with given data.

True or False: To find the firm's fixed costs, additional information about total costs is needed.

True. Fixed costs cannot be determined from the provided data alone.

True or False: The firm's average variable cost (AVC) is \$21, which means variable costs are a significant portion of total costs.

True. Since AVC is high relative to total revenue, variable costs constitute a large part of total costs.

Based on the data, what is the firm's total fixed cost?

Cannot be determined with the given information, as fixed costs are not provided.

Additional Resources

True or False: A Firm Produces 42 Units of Output, Its AVC Is \$21, and Its TR Is \$924 — With the Given Info, What Can We Infer?

Understanding the financial and operational health of a business often hinges on interpreting key economic metrics such as total revenue (TR), average variable cost (AVC), and output levels. When these figures are presented together, they can reveal much about the firm's cost structure, profitability, and efficiency. In this analysis, we examine the statement: "A firm produces 42 units of output, its AVC is \$21, and its TR is \$924," to determine its accuracy and implications. We will explore the relationships among these variables, assess the plausibility of the data, and analyze what additional insights can be derived.

Understanding the Key Concepts

Before delving into the specifics of the given scenario, it is essential to clarify the fundamental concepts involved:

Total Revenue (TR)

Total revenue is the total income generated from selling a certain quantity of goods or services. It is calculated as:

$$[TR = \text{Price per unit} \times \text{Quantity sold}]$$

Understanding TR helps in evaluating the firm's sales performance and profitability.

Average Variable Cost (AVC)

Average variable cost represents the variable cost per unit produced. Variable costs change directly with the level of output and include expenses such as raw materials, direct labor, and utility costs associated with production. It is calculated as:

$$[AVC = \frac{\text{Total Variable Cost}}{\text{Quantity}}]$$

Knowing the AVC helps in analyzing short-term cost behavior and determining the minimum price at which the firm can cover its variable costs.

Output Quantity (Q)

The quantity of units produced and sold directly impacts revenue, costs, and overall profitability. The given data states the firm produces 42 units.

Analyzing the Data: Key Calculations and Relationships

With the core data provided, we can perform several calculations to assess the firm's financial status:

- Quantity of output (Q): 42 units
- AVC: \$21 per unit
- TR: \$924

Step 1: Calculate Total Variable Cost (TVC)

Using the formula:

$$[TVC = AVC \times Q]$$

$$[TVC = \$21 \times 42 = \$882]$$

Step 2: Determine Total Revenue (TR)

Given $TR = \$924$, this is the total income from sales.

Step 3: Find the Total Fixed Cost (TFC)

Total cost (TC) is the sum of fixed and variable costs:

$$[TC = TFC + TVC]$$

The profit (or loss) can be assessed if the total revenue exceeds total costs.

Assessing the Profitability and Cost Structure

To determine whether the firm is profitable, examine whether TR exceeds total costs:

$$[\text{Profit} = TR - TC]$$

However, since we only have TR and TVC, we need to estimate total costs. The key missing piece is the fixed costs.

Step 1: Calculate Total Cost (TC)

$$[TC = TFC + TVC]$$

Without fixed costs, we cannot directly compute TC, but we can analyze the revenue in relation to costs.

Step 2: Estimating the Selling Price per Unit

From TR and quantity:

$$[\text{Price, per, unit} = \frac{TR}{Q} = \frac{\$924}{42} = \$22]$$

The firm sells each unit at \$22.

Step 3: Comparing Price to AVC

The selling price per unit is \$22, while the AVC is \$21, indicating that:

- The firm is covering its variable costs per unit.
- The contribution margin per unit is:

$$[\text{Contribution} = \text{Price} - \text{AVC} = \$22 - \$21 = \$1]$$

This marginal contribution contributes towards fixed costs and profit.

Step 4: Implications for Profitability

Total contribution margin:

$$[\text{Total Contribution} = \text{Contribution} \times Q = \$1 \times 42 = \$42]$$

If the total fixed costs are zero or less than \$42, the firm makes a profit; if fixed costs are higher, it incurs a loss.

Is the Statement True or False? Analyzing the Validity of the Data

Based on the calculations, the key question is whether the data provided is consistent and logical.

Scenario 1: The Data is Consistent and Plausible

- The firm produces 42 units.
- Sells each at \$22.
- Total revenue is \$924, which matches the calculation.
- The AVC is \$21, slightly less than the selling price, indicating the firm is covering variable costs and possibly making a small profit if fixed costs are negligible or zero.

Scenario 2: Potential Inconsistencies

- Cost structure: If the AVC is \$21, and the selling price is \$22, then the contribution margin per unit is only \$1, which is quite low. This could suggest tight profit margins, susceptible to changes in costs or prices.
- Fixed costs: The data does not specify fixed costs. If fixed costs are substantial, the firm's profit could be minimal or negative.
- Profitability assessment: Assuming fixed costs are zero, the firm earns:

$$[\text{TR} - \text{TVC} = \$924 - \$882 = \$42]$$

which is a very low profit margin. If fixed costs exist, the firm may not be profitable.

Conclusion:

Given the data, the statement appears to be true in terms of the internal consistency of the numbers. The calculations align logically: the total revenue matches the unit sale price times output, and the total variable costs are consistent with the AVC and output.

Implications for Business Analysis and Decision-Making

Understanding these figures offers insights into the firm's operational efficiency and strategic considerations:

- Margin of Safety: The small contribution margin suggests limited buffer against increases in costs or decreases in prices.
- Cost Control: Maintaining or improving the AVC is critical; any increase could erode profitability.
- Pricing Strategy: Selling at \$22 per unit when AVC is \$21 leaves a narrow profit margin of \$1 per unit, highlighting the importance of pricing strategies and cost management.
- Fixed Costs Impact: Without data on fixed costs, it's difficult to assess overall profitability; however, even with positive contribution margins, fixed costs could negate profits.

Conclusion: Final Thoughts on the Statement's Truthfulness

Based on the detailed analysis, the statement “A firm produces 42 units of output, its AVC is \$21, and its TR is \$924” is true in terms of the numerical relationships and internal consistency of the provided data. The calculations validate that the total revenue aligns with the unit sales price and quantity, and the total variable costs align with the AVC and output level.

However, this truthfulness does not necessarily imply profitability or business success. The narrow profit margin and unspecified fixed costs suggest a fragile financial position that warrants further investigation. The analysis underscores the importance of comprehensive financial data for accurate assessments. Managers and stakeholders should focus not only on these figures but also on fixed costs, market conditions, and strategic opportunities to enhance profitability and operational efficiency.

In the dynamic world of business, numbers tell a story. Recognizing their interconnectedness enables firms to make informed decisions, optimize costs, and strategize for sustainable growth.

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