Solve The Following Functions For F(x): 4, -3, -2.7, -4.9 (show All Your Work) F(x)=2x2+4x F(x)= V=x+

Solve The Following Functions For F(x): 4, -3, -2.7, -4.9 (show All Your Work) F(x)=2x2+4x F(x)= V=x+

Introduction

Mathematics is a fundamental discipline that forms the backbone of numerous scientific and engineering fields. One of the core areas in mathematics is understanding how functions behave and how to evaluate them for specific input values. Solving functions for given inputs is a vital skill that enables students and professionals to analyze relationships and predict outcomes effectively.

In this article, we will focus on solving two particular functions for specific values of x. The functions are:

- $F(x) = 2x^2 + 4x$
- $V = x +$

The task is to evaluate these functions for the input values: 4, -3, -2.7, and -4.9. We will show all work and explain each step carefully to ensure clarity and understanding.

This comprehensive guide is tailored for students, educators, and anyone interested in mastering function evaluation, especially quadratic functions. We will cover the necessary concepts, detailed calculations, and tips for solving similar problems in the future.

Understanding the Functions

Before diving into calculations, it’s essential to understand the structure and meaning of the functions involved.

The Quadratic Function $F(x) = 2x^2 + 4x$

This is a quadratic function, which means it involves the square of x. Quadratic functions graph as parabolas and are fundamental in algebra. The general form is:

$$
F(x) = ax^2 + bx + c
$$

In our case:

- $a = 2$
- $b = 4$
- $c = 0$

Knowing this form helps us anticipate the shape and properties of the function graph.

The Function $V = x +$

The second function appears incomplete as written: $V = x +$. It seems there might be a missing part or typographical error. Assuming the intended function is:

$$
V = x + \text{(something)}
$$

or perhaps:

$$
V = x + k
$$

where k is a constant, but since no additional information is provided, we will focus primarily on the quadratic function $F(x) = 2x^2 + 4x$, which is explicitly defined.

If you intended a different form for V, please clarify. For now, we will proceed with evaluating $F(x)$ for the given values.

Calculating $F(x) = 2x^2 + 4x$ for Various Values of x

Let's proceed step-by-step to evaluate the function at each specified x value.

1. When $x = 4$

Step 1: Substitute $x = 4$ into the function:

$$
F(4) = 2(4)^2 + 4(4)
$$

Step 2: Calculate 4^2:

$$
4^2 = 16
$$

Step 3: Multiply by 2:

$$
2 \times 16 = 32

\]

Step 4: Calculate 4×4:

$$
4 \times 4 = 16
$$

Step 5: Add the results:

$$
F(4) = 32 + 16 = 48
$$

Result: $\boxed{F(4) = 48}$

---

2. When $x = -3$

Step 1: Substitute $x = -3$:

$$
F(-3) = 2(-3)^2 + 4(-3)
$$

Step 2: Calculate $(-3)^2$:

$$
(-3)^2 = 9
$$

Step 3: Multiply by 2:

$$
2 \times 9 = 18
$$

Step 4: Calculate 4×-3:

$$
4 \times -3 = -12
$$

Step 5: Add the results:

$$
F(-3) = 18 + (-12) = 6
$$

Result: $\boxed{F(-3) = 6}$

---

3. When $x = -2.7$

Step 1: Substitute $x = -2.7$:

$$
F(-2.7) = 2(-2.7)^2 + 4(-2.7)
$$

Step 2: Calculate $(-2.7)^2$:

$$
(-2.7)^2 = 7.29
$$

Step 3: Multiply by 2:

$$
2 \times 7.29 = 14.58
$$

Step 4: Calculate 4×-2.7:

$$
4 \times -2.7 = -10.8
$$

Step 5: Add the results:

$$
F(-2.7) = 14.58 + (-10.8) = 14.58 - 10.8 = 3.78
$$

Result: $\boxed{F(-2.7) = 3.78}$

---

4. When $x = -4.9$

Step 1: Substitute $x = -4.9$:

$$
F(-4.9) = 2(-4.9)^2 + 4(-4.9)
$$

Step 2: Calculate $(-4.9)^2$:

$$
(-4.9)^2 = 24.01
$$

Step 3: Multiply by 2:

$$
2 \times 24.01 = 48.02
$$

Step 4: Calculate 4×-4.9:

$$
4 \times -4.9 = -19.6
$$

Step 5: Add the results:

$$
F(-4.9) = 48.02 + (-19.6) = 48.02 - 19.6 = 28.42
$$

Result: $\boxed{F(-4.9) = 28.42}$

Summary of Results

x value	$F(x) = 2x^2 + 4x$	Calculations Summary	Final Result
4	$2 \times 16 + 4 \times 4$	$32 + 16 = 48$	48
-3	$2 \times 9 + 4 \times -3$	$18 - 12 = 6$	6
-2.7	$2 \times 7.29 + 4 \times -2.7$	$14.58 - 10.8 = 3.78$	3.78
-4.9	$2 \times 24.01 + 4 \times -4.9$	$48.02 - 19.6 = 28.42$	28.42

Additional Insights and Graphical Interpretation

Understanding the function's behavior at these points offers valuable insights:

- The quadratic function opens upwards since $a=2 > 0$.
- The minimum point (vertex) can be found using the vertex formula for quadratics:

$$
x_{vertex} = -\frac{b}{2a} = -\frac{4}{2 \times 2} = -\frac{4}{4} = -1
$$

At $x = -1$:

$$
F(-1) = 2(-1)^2 + 4(-1) = 2(1) - 4 = 2 - 4 = -2
$$

This indicates the lowest point on the parabola is at $(-1, -2)$.

Plotting the Function

Plotting the points \((x, F(x))\):

- \((-4.9, 28.42)\)
- \((-3, 6)\)
- \((-2.7, 3.78)\)
- \((4, 48)\)
- Vertex at \((-1, -2)\)

The graph is a parabola opening upward with its vertex at \((-1, -2)\), which is below all the evaluated points, confirming the function's minimum.

Clarification on the \(V = x +\) Function

As previously mentioned, the second function \(V = x +\) appears incomplete. If you intended it to be:

- \(V = x + c\), where \(c\) is a constant, then evaluating \(V\) at the same \(x\) values would be straightforward (simply add \(c\) to each \(x\)).

- Or perhaps a different function altogether; please provide additional details to assist further.

Tips for Solving Function Evaluation Problems

- Always substitute carefully: Ensure you replace the variable with the correct value, paying close attention to signs.
- Order of operations: Follow PEMDAS (Parentheses

Frequently Asked Questions

What is F(x) when x = 4 for the function F(x) = 2x^2 + 4x?

F(4) = 2(4)^2 + 4(4) = 2(16) + 16 = 32 + 16 = 48

Calculate F(x) when x = -3 for the function F(x) = 2x^2 + 4x.

F(-3) = 2(-3)^2 + 4(-3) = 2(9) - 12 = 18 - 12 = 6

Find F(x) for x = -2.7 in the function F(x) = 2x^2 + 4x.

F(-2.7) = 2(-2.7)^2 + 4(-2.7) = 2(7.29) - 10.8 = 14.58 - 10.8 = 3.78

Determine F(x) when x = -4.9 for the function F(x) = 2x^2 + 4x.

$F(-4.9) = 2(-4.9)^2 + 4(-4.9) = 2(24.01) - 19.6 = 48.02 - 19.6 = 28.42$

What is the value of F(x) = √x when x = 4? (Assuming F(x) = √x)

$F(4) = \sqrt{4} = 2$

Calculate F(x) = √x when x = -3, and explain the result.

$F(-3) = \sqrt{-3}$ is not defined for real numbers because the square root of a negative number is imaginary.

Additional Resources

Solving functions for specific values of x is a fundamental exercise in algebra that deepens understanding of how functions behave across different inputs. In this comprehensive analysis, we will explore two functions: $F(x) = 2x^2 + 4x$ and V = x + (unspecified), and evaluate them for given x-values: 4, -3, -2.7, and -4.9. Through detailed calculations and explanations, we aim to clarify the process of substituting values, performing algebraic operations, and interpreting the results. This article is designed to serve as an educational resource, guiding readers step-by-step through the problem-solving process and highlighting key concepts in function evaluation.

Understanding the Functions and Their Structures

1. The Quadratic Function: $F(x) = 2x^2 + 4x$

The first function, F(x), is a quadratic function characterized by a squared term and a linear term. The general form of a quadratic function is $ax^2 + bx + c$, where in our case:

- a = 2
- b = 4
- c = 0 (since no constant term is explicitly provided)

Quadratic functions are notable for their parabolic graphs, symmetry, and the way they change values based on the input x. Evaluating F(x) at specific points involves substituting the value of x into the formula, performing exponentiation, multiplication, and addition.

Key features:

- Coefficient of x^2 (2) affects the parabola's opening direction and width.

- The linear coefficient (4) influences the slope of the parabola.

2. The V Function: V = x + (unspecified)

The second function, V, appears to be incomplete or possibly a typographical error, as it states "V = x + " with an incomplete expression after the plus sign. For the purpose of this analysis, we will assume that the intended function is:

- $V(x) = x + k$, where k is some constant or variable.

However, since no further details are provided, and the original prompt mentions "V = x + ", we will proceed with two interpretations:

- Interpretation A: $V(x) = x + 0$, simplifying to $V(x) = x$.
- Interpretation B: $V(x) = x +$ some constant value, which could be contextually inferred if more information was available.

Given the ambiguity, the most straightforward approach is to evaluate V(x) as $V(x) = x$, meaning the function is simply the identity function for the given x-values.

Step-by-Step Evaluation of $F(x) = 2x^2 + 4x$

To understand how the function behaves at different x-values, we will evaluate it systematically for each of the four x-values: 4, -3, -2.7, and -4.9. The process involves substituting each value into the function and simplifying.

1. When x = 4

Step 1: Substitute x = 4 into the function

$F(4) = 2(4)^2 + 4(4)$

Step 2: Calculate the square

$(4)^2 = 16$

Step 3: Multiply by 2

2 16 = 32

Step 4: Multiply 4 by 4

4 4 = 16

Step 5: Sum the results

$F(4) = 32 + 16 = 48$

Result: When $x = 4$, $F(x) = 48$.

2. When x = -3

Step 1: Substitute $x = -3$

$F(-3) = 2 (-3)^2 + 4 (-3)$

Step 2: Calculate the square

$(-3)^2 = 9$

Step 3: Multiply by 2

$2\ 9 = 18$

Step 4: Multiply 4 by -3

$4 (-3) = -12$

Step 5: Sum the results

$F(-3) = 18 + (-12) = 6$

Result: When $x = -3$, $F(x) = 6$.

3. When x = -2.7

Step 1: Substitute $x = -2.7$

$F(-2.7) = 2 (-2.7)^2 + 4 (-2.7)$

Step 2: Calculate the square

$(-2.7)^2 = (-2.7) (-2.7) = 7.29$

Step 3: Multiply by 2

$2\ 7.29 = 14.58$

Step 4: Multiply 4 by -2.7

$4 (-2.7) = -10.8$

Step 5: Sum the results

$F(-2.7) = 14.58 + (-10.8) = 3.78$

Result: When $x = -2.7$, $F(x) \approx 3.78$.

4. When x = -4.9

Step 1: Substitute $x = -4.9$

$F(-4.9) = 2 (-4.9)^2 + 4 (-4.9)$

Step 2: Calculate the square

$(-4.9)^2 = 24.01$

Step 3: Multiply by 2

$2 24.01 = 48.02$

Step 4: Multiply 4 by -4.9

$4 (-4.9) = -19.6$

Step 5: Sum the results

$F(-4.9) = 48.02 + (-19.6) = 28.42$

Result: When $x = -4.9$, $F(x) \approx 28.42$.

Analyzing the Results and Function Behavior

The evaluation of F(x) at different points reveals several important insights into the function's behavior.

1. Quadratic Nature and Symmetry

Quadratic functions are symmetric about their vertex. Although the exact vertex can be calculated using the vertex formula:

$x_{vertex} = -b / (2a) = -4 / (2 2) = -4 / 4 = -1$

Substituting $x = -1$ into F(x):

$F(-1) = 2 (-1)^2 + 4 (-1) = 2 1 - 4 = -2$

This indicates that the parabola opens upwards (since $a = 2 > 0$), with its minimum point at $x = -1$, where the function attains a value of -2.

The evaluated points fit within this context:

- At $x = -3$, $F(x) = 6$ (above the vertex minimum)
- At $x = -2.7$, $F(x) \approx 3.78$ (approaching the minimum from above)
- At $x = 4$, $F(x) = 48$ (far from the vertex, on the right side)
- At $x = -4.9$, $F(x) \approx 28.42$ (far from the vertex on the left side)

2. Growth and Rate of Change

The quadratic's values increase rapidly as x moves away from the vertex, especially in the positive x-direction. For example:

- Moving from $x = -1$ to $x = 4$, $F(x)$ increases from -2 to 48.
- Moving from $x = -1$ to $x = -4.9$, $F(x)$ increases from -2 to approximately 28.42.

This demonstrates the quadratic's characteristic of accelerating growth as $|x|$ increases.

3. Implications for Real-World Applications

Understanding how F(x) behaves at different x-values provides insights into potential real-world applications:

- In physics, quadratic functions model projectile motion; knowing specific values helps predict position at given times.
- In economics, quadratic cost functions can inform pricing strategies.
- In engineering, stress-strain relationships may follow quadratic patterns.

The evaluated points help calibrate models and predict outcomes accurately.

Evaluating the V Function: X +

Given the ambiguity surrounding the V function, and assuming the simplest interpretation $V(x) = x$, the evaluation at the same x-values yields:

- $V(4) = 4$
- $V(-3) = -3$
- $V(-2.7) = -2.7$
- $V(-4.9) = -4.9$

If the original function was intended to be $V(x) = x$ + some constant, additional information would be necessary to perform precise calculations.

Alternative interpretations could involve:

- $V(x) = x + c$, where c is a known constant. For example, if $c = 2$, then $V(4) = 4 + 2 = 6$.
- $V(x) = x + x^2$, which would involve quadratic evaluation.

Without explicit details, the most reasonable assumption is that $V(x) = x$.

Final Summary and Conclusions

The process of solving functions at specific x-values involves fundamental algebraic skills, including substitution, exponentiation, multiplication, and addition. The detailed calculations for $F(x) = 2x^2 + 4x$

Solve The Following Functions For F X 4 3 2 7 4 9 Show All Your Work F X 2x2 4x F X V X

Solve The Following Functions For F X 4 3 2 7 4 9 Show All Your Work F X 2x2 4x F X V X

Related Articles

- To Cool A Given Room It Is Necessary To Supply 3 Ft3/s Of Air Through An 3 In Diameter Pipe. (a) What
- The Graph Shows The Heights, Y (in Centimeters), Of A Plant After A Certain Number Of Weeks, X. Donna
- This Is About TESLA INCConsider The Political Environment For The Areas That Your Business Will Trade

Back to Home