

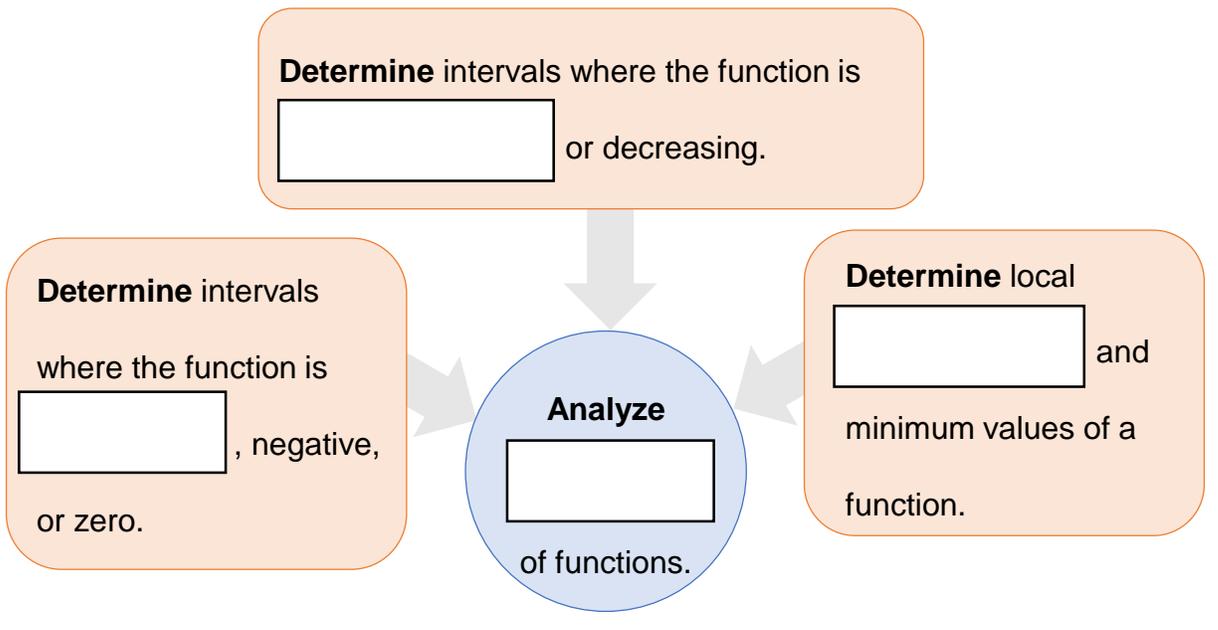
Warm-Up | Analyzing Graphs



Lesson Question



Lesson Goals



Words to Know

Fill in this table as you work through the lesson. You may also use the glossary to help you.

	the point on a graph at which the graph crosses the x -axis
	smallest function value over a specific interval of the domain
	largest function value over a specific interval of the domain

W
2K**Words to Know**

Fill in this table as you work through the lesson. You may also use the glossary to help you.

	a function's behavior as the input values increase to positive infinity or decrease to negative infinity
	all the values found between two given endpoints
	the point on a graph at which the graph crosses the y -axis

**Using Graphs to Find Function Input and Output Values**

Use the graph of $g(x)$ to find the indicated function's values.

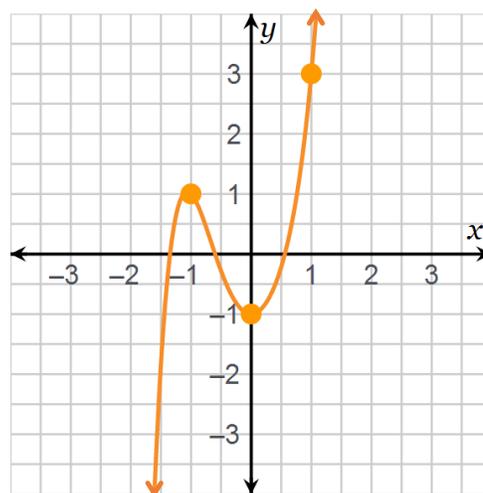
Circle the point with an input of -1 .

$$g(-1) = \square$$

Circle the point with an output of 3 .

$$g(-1) = 3$$

$$x = \square$$



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Intercepts of a Graph

Example: Analyze the function's graph and determine its intercepts, if any.

of the axes

x -intercept(s)

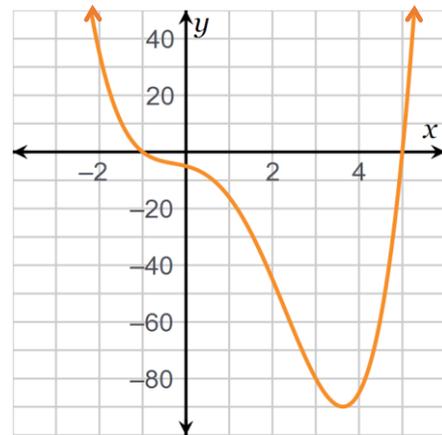
Draw a point at each x -intercept.

(, 0), (, 0)

y -intercept

Draw a point at the y -intercept.

(0 ,)



Important Features of Graphs

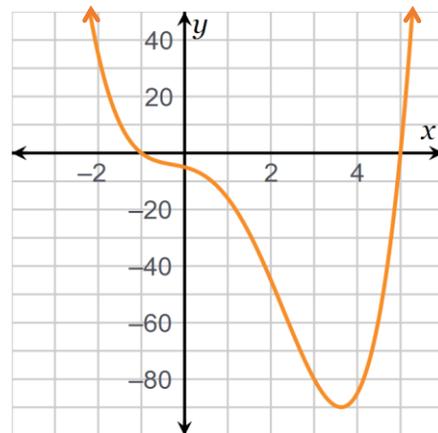
Analyze the function's graph and determine the where the graph is positive or negative.

$f(x) > 0$

($-\infty$,) \cup (, ∞)

$f(x) < 0$

(-1 ,)



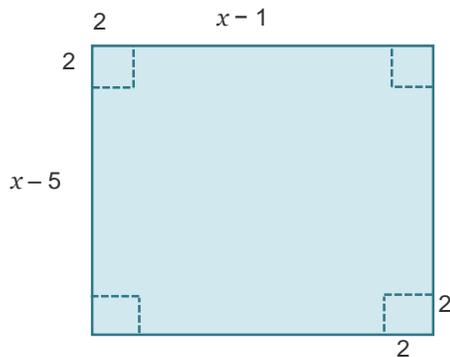
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Analyzing Graphs in Context

REAL-WORLD CONNECTION

Lorena is making a storage container from a piece of cardboard with side lengths $(x + 3)$ and $(x - 1)$. She is going to cut 2 in. from each corner to be folded up for storage. The equation that represents the volume of the container is $V(x) = (x - 1)(x - 5)(2)$.



The input represents:

x is used to determine the length and the of our box.

The output represents:

$V(x)$ represents the of our box.

UNDERSTANDING THE GRAPH

Consider the graph that represents the volume of Lorena's container.

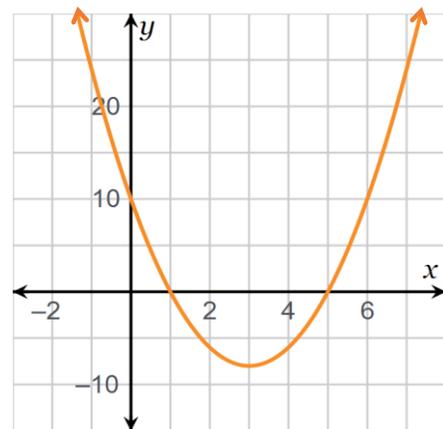
What do the intercepts mean in terms of the context?

x -int.: (, 0), (, 0)

y -int.: (0,)

What is an appropriate domain for the given function?

(, ∞)



Instruction

Analyzing Graphs

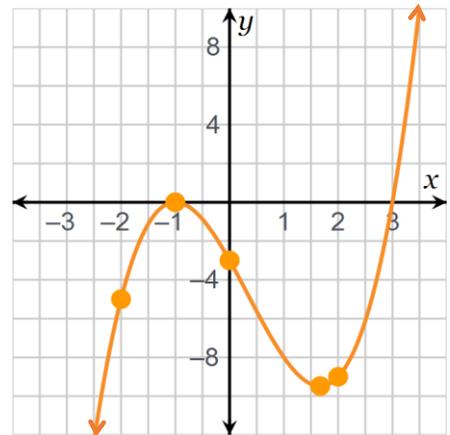
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Analyzing a Function's End Behavior

Analyze the graph to determine the .

- As x goes to $+\infty$, the function's values go to .
- As x goes to $-\infty$, the function's values go to .



Determining When a Function is Increasing or Decreasing

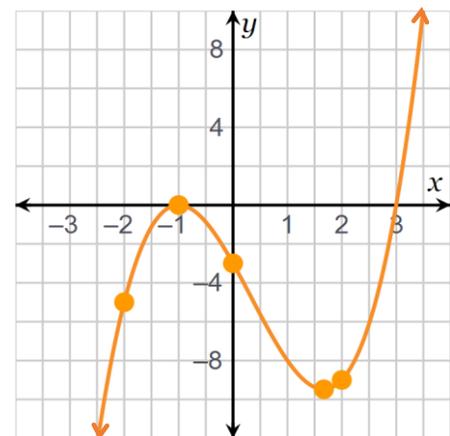
Analyze the graph to determine the intervals of decreasing and increasing function values.

For what x -values are the function's values increasing?

$$\left(-\infty, \boxed{}\right) \cup \left(\boxed{}, \infty\right)$$

For what x -values are the function's values ?

$$\left(\boxed{}, \frac{5}{3}\right)$$



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Calculating Local Maximum and Local Minimum Values

Use the graph to determine the **local**

minimum and **local**

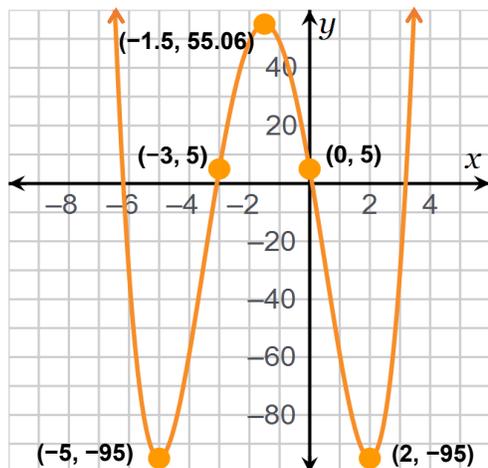
values for the function.

Local minimum:

(, -95) and (, -95)

Local maximum:

(, 55.06)



Summary

Analyzing Graphs

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Lesson
Question

What can you tell about a functional relationship from its graph?

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Answer

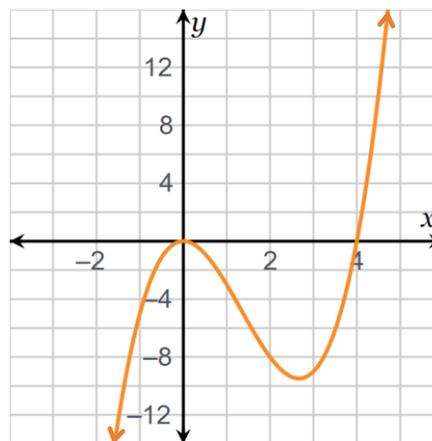
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Review: Key Concepts

Key features of a function's graph allow for a detailed analysis of the represented relationship.

- Intercepts indicate where the graph crosses the .
- Positive and negative function values indicate location relative to the -axis.
- Local maximums and indicate where a function changes from increasing to decreasing or vice versa.





Summary

Analyzing Graphs

Use this space to write any questions or thoughts about this lesson.