

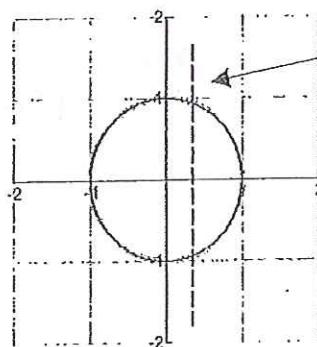
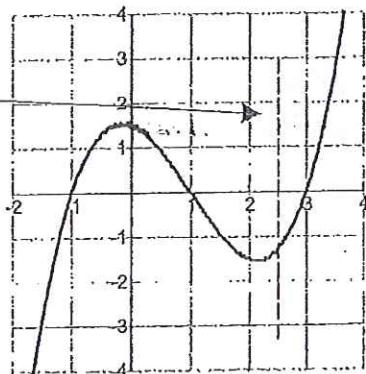
Recognizing Functions

A function is a relationship in which each value of the independent (control) variable determines exactly one value of the dependent variable.

Vertical Line Test: A graph with the independent variable on the horizontal axis represents a function if no vertical line meets the graph in more than one place.

No two points lie on the same vertical line

This graph represents a function



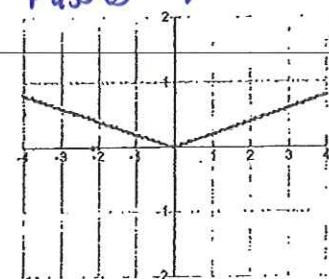
Two points lie on the same vertical line

This graph does not represent a function

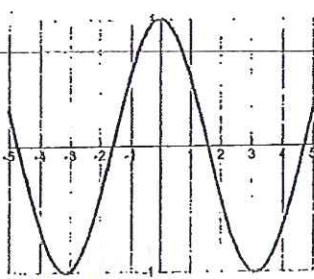
Tell whether each graph represents a function when x is the independent variable. Explain how you know.

$VLT = \text{vertical Line Test}$

1. Yes
Passes VLT

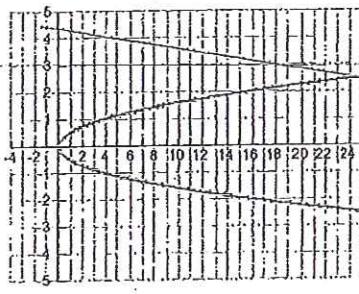


2.



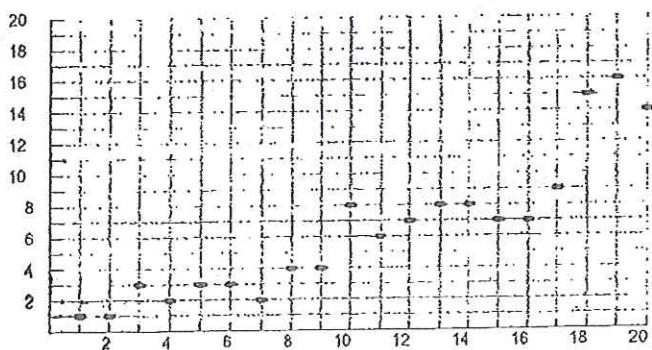
Yes
Passes VLT

3.



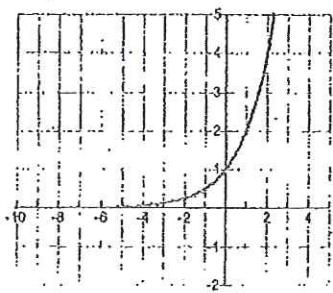
No
Fails VLT

4. Could this graph be represented with a function?



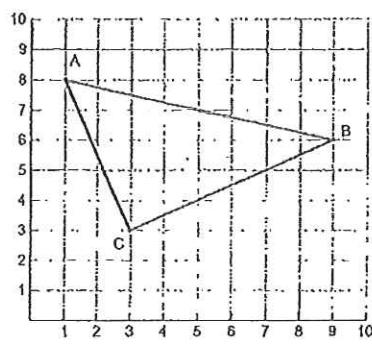
Yes
Passes VLT

5.



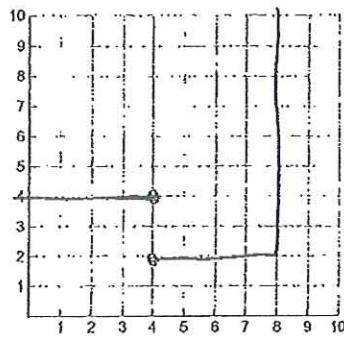
Passes VLT

6.



*No
Fails VLT*

7.



*No
Fails VLT*

Draw two graphs that are functions and two graphs that are not functions. Explain below how you know each of the graphs can be represented by a function or not.

Function Graphs

A graph on a Cartesian coordinate system with x and y axes ranging from -10 to 10. The curve is a parabola opening upwards with its vertex at (-3, -4). It passes through points such as (-5, 0), (-4, 1), (-3, -4), (-2, -9), (-1, -16), (0, -25), (1, -36), (2, -49), (3, -64), and (4, -81). Every vertical line it intersects passes through exactly one point, so it is a function.

Passes VLT

A graph on a Cartesian coordinate system with x and y axes ranging from -10 to 10. The curve is a parabola opening upwards with its vertex at (3, -3). It passes through points such as (-5, 16), (-4, 9), (-3, -3), (-2, 4), (-1, 1), (0, 0), (1, 1), (2, 4), (3, -3), (4, 9), and (5, 16). Every vertical line it intersects passes through exactly one point, so it is a function.

Non-Function Graphs

A graph on a Cartesian coordinate system with x and y axes ranging from -10 to 10. It shows a circle centered at (3, 3) with a radius of 4, passing through points like (7, 7), (1, 1), (-1, -1), and (-5, -5). A vertical line at x = 3 intersects the circle at two points, (3, 1) and (3, 5), so the circle does not pass the vertical line test and is not a function.

Fails VLT

A graph on a Cartesian coordinate system with x and y axes ranging from -10 to 10. It shows a circle centered at (-3, -3) with a radius of 4, passing through points like (-7, -7), (-1, -1), (1, 1), and (7, 7). A vertical line at x = -3 intersects the circle at two points, (-3, 1) and (-3, 5), so the circle does not pass the vertical line test and is not a function.