Function or Not a Function?

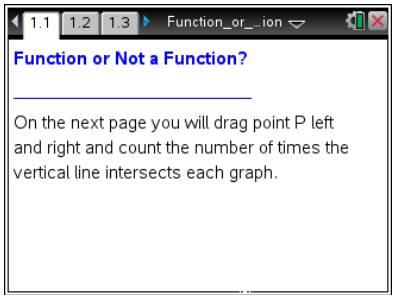
Student Activity

Name _____

Class _____

Open the TI-Nspire document *Function_or_Not_a_Function.tns*.

In this activity, you will investigate some input-output relations. How do you determine if a relation is a function? This is an important concept in mathematics, and we will explore various methods used to do this.



Move to page 1.2.

1. Grab point *P* to move the vertical line across the graphs. Move point *P* back and forth to observe the number of times the vertical line intersects each graph at different parts of the graph.
   a. Does the vertical line ever intersect the graph labeled ***Function*** at more than one point?

   b. Does the vertical line ever intersect the graph labeled ***Non-Function*** at more than one point?

2. Based on your observations in question 1:
   a. A vertical line intersects the graph of the ***Function*** at more than one point (circle one):

      ALWAYS SOMETIMES NEVER

   b. A vertical line intersects the graph of the ***Non-Function*** at more than one point (circle one):

      ALWAYS SOMETIMES NEVER

3. Move the vertical line so that it intersects the ***Non-Function*** graph at more than one point.
   a. What do the coordinates of these points have in common?

   b. What is different about the coordinates of these points?

Move to page 1.3.

4. The tables display ordered pairs from a function and a non-function.

   a. How are the tables the same?

   b. How are the tables different?

5. A ***function*** is a relation for which every possible input value *x* has only one output value *y.* Based on this definition:

   a. Explain why the *graph* labeled ***Non-Function*** on page 1.2 does not represent a function.

   b. Explain why the *table* labeled ***Non-Function*** on page 1.3 does not represent a function.

Move to page 2.1.

6. Examine the graph and table. Grab point *P,* and drag the vertical line back and forth to explore the graph of the equation $3x - y + 1 = 0$. Is $3x - y + 1 = 0$ a function? Why or why not?

Move to page 3.1.

7. Examine the graph and table. Grab point *P,* and drag the vertical line back and forth to explore the graph of the equation $y = x^2 - 2$. Is $y = x^2 - 2$ a function? Why or why not?

Move to page 4.1.

8. Examine the graph and table. Grab point *P,* and drag the vertical line back and forth to explore the graph of the equation $x = |y| - 3$. Is $x = |y| - 3$ a function? Why or why not?

Move to page 5.1.

9. Examine the graph and table. Grab point *P,* and drag the vertical line back and forth to explore the graph of the equation $x^2 + y^2 = 25$. Is $x^2 + y^2 = 25$ a function? Why or why not?

10. How do you determine whether or not you have a function if you are given:

    a. a graph?

    b. a table of values?