Piecewise Functions

@BootstrapWorld
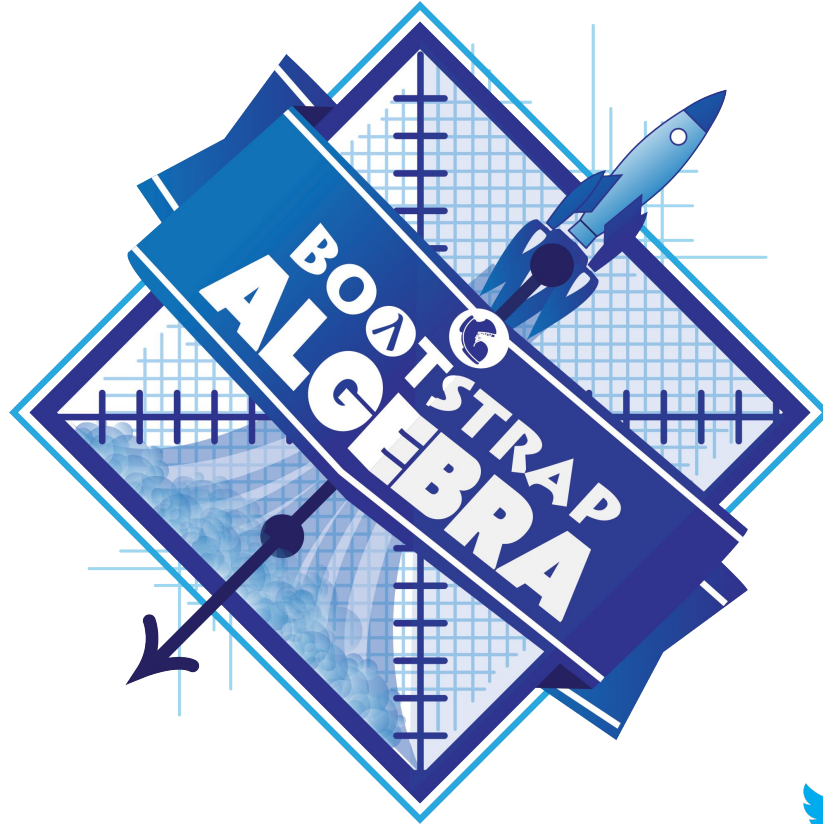
Not every function is smooth

Boxes of candy cost $2 each. A graph of revenue-v-sales looks like a straight line with a slope of 2.

If there's a "bulk discount" where the price drops to $1 for the 21st box of candy and every box after that, the graph *is no longer a straight line!*
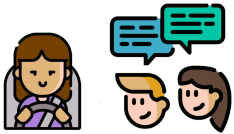
Instead, the line has a kink in it at 21 boxes, where the slope **suddenly changes from 2 to 1**.

Not every function is smooth

1. Save a copy, then click "Run"

2. Select a Driver

3. Complete [Welcome to Alice's Restaurant](#) (**Page 48**) as a team

4. Select one person to be ready to share back your answers for the group!

Not every function is smooth

- What are some *familiar* things you noticed in this file?

- What *new* things did you notice in this file?

- What function was being defined there? What is its contract?

- How do you think this function works?

Defining Piecewise Functions

Complete [Alice's Restaurant - Explore](#) (**Page 49**)

Why do you get an error when you try to use the `sales-tax` function for an item that isn't on the menu?
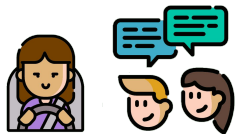
Is it OK for a function to break it's own contract?

How can the Design Recipe help us define Piecewise Functions?

Defining Piecewise Functions

Contract and Purpose Statement

Every contract has three parts…

order :: Number -> Number

    function name   *domain*   *range*

Consumes an item & produces price. Hamburger=$6, Onion Rings=$3.50,tofu=$5.25, pie=$2.25

    what does the function do?

Examples

Write some examples, then circle and label what changes…

examples:

     item   **price**

  order   ("pie"   ) is   2.25
  function name   *input(s)*   *what the function produces*

  order   ("hamburger"   ) is   6.00
  function name   *input(s)*   *what the function produces*

TWO things are changing???

Definition

Write the definition, giving variable names to all your input values…

fun   order   (**item**   ) :
  function name   *variable(s)*

ask:

| string-equal(item, "pie")   then: **2.25**

| string-equal(item, "hamburger")   then: **6.00**

Defining Piecewise Functions

Can you think of any situations in real life that can be modeled using a piecewise function?

Is "square root" a piecewise function? Why or Why not?

Is "absolute value" a piecewise function? Why or Why not?

stsrapGS
Students, write your response!
@Bootstrap World
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