Piecwise Functions

Review

> Make notebook easy to follow

a) Use functions to show structre of code

b) use palettes

> Table and Sum commands are very similar

a) Table[function[n],{n,nmin,nmax}]

b) Sum[function[n],{n,nmin,nmax}]

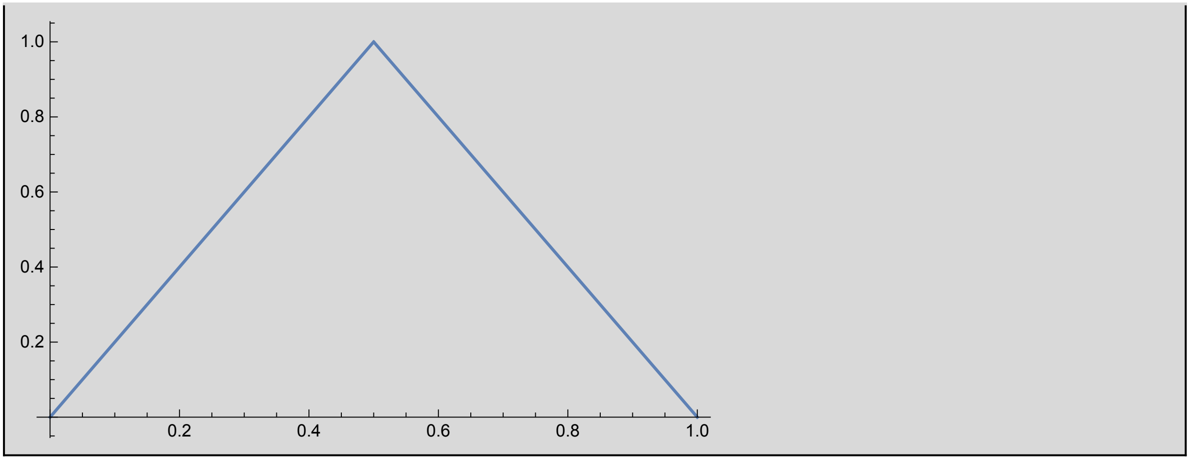
> When using table, our function[n] needn't be a 'mathematical' function but can be for example a plot.

Introduction

1. Translate
2. Solve
3. Interpret

Motivation

How would we plot the following graph?



Introduction to Piecewise

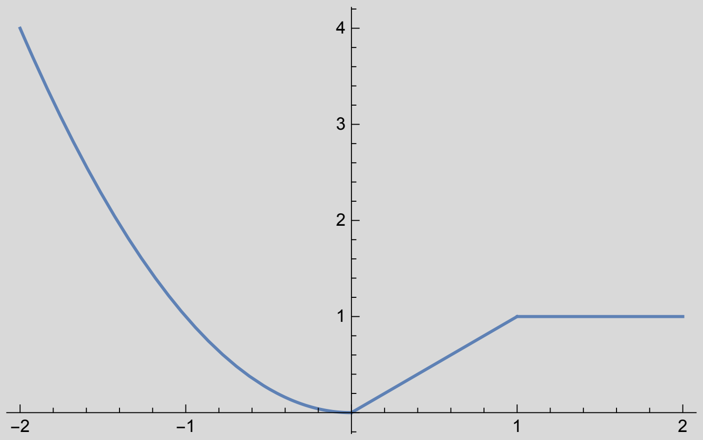
```
Piecewise[{list}, value at other points]
```

```
Piecewise[{{function1, range1}, {function2, range2}}, value at other points]
```

Suppose we are given that the function is $f(x) = \begin{cases} x^2 & x < 0 \\ x & 0 < x < 1 \\ 1 & \text{otherwise} \end{cases}$

```
FuncTrial[x_] := Piecewise[{{x^2, x < 0}, {x, 0 < x < 1}}, 1]
```

```
Plot[FuncTrial[x], {x, -2, 2}]
```

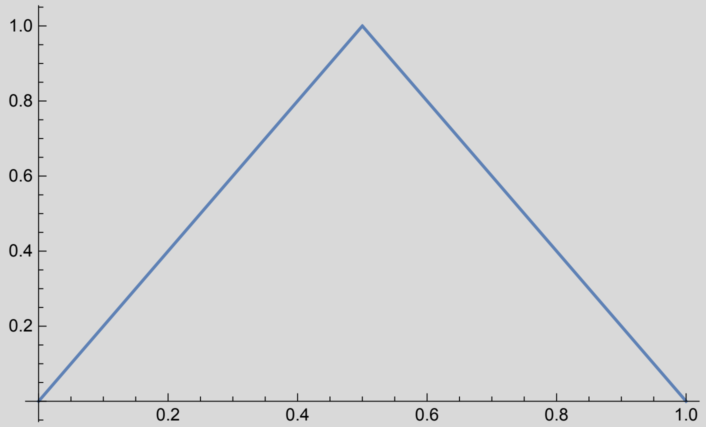


Example

Suppose we are given that the function is $f(x) = \begin{cases} 2x & 0 < x < \frac{1}{2} \\ -2x + 2 & \frac{1}{2} < x < 1 \end{cases}$

```
Func[x_] := Piecewise[{{2 x, 0 < x < 1/2}, {-2 x + 2, 1/2 < x < 1}}, 0]
```

```
Plot[Func[x], {x, 0, 1}]
```



Summary

1. When approaching a physics problem split it into 3 steps

i) Translating the physical situation into a mathematical expression

ii) applying techniques to solve the mathematical expression

iii) interpreting your solution.

2. Input - Piecewise[{{function1,range1},{function2, range2},..,{function-N, range-N}},value at other points]

3. For a pair of coordinates (a,b,) and (c,d) we calculate the gradient of the line and then substitute values into the equation y-b=m(x-a)