Chapter 8 Section 3

MA1032 Data, Functions & Graphs

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Function Arithmetic

$$f(x) = x^2 + 2 \quad g(x) = x$$

- Addition
- Subtraction
- Multiplication
- Division

Graphically

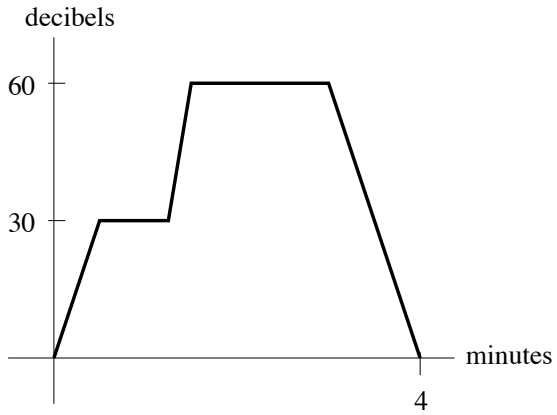
Let $u(t)$ be the basic step function:

$$u(t) = \begin{cases} 0 & \text{if } t < 0, \\ 1 & \text{if } 0 \leq t \leq 1, \\ 0 & \text{if } t > 1. \end{cases}$$

Sketch the graph of $u(t) * u(t-2)$.
Domain & Range?

Example

Mike is a Pearl Jam fanatic and goes into a daze every time he hears the first track of their latest CD. The loudness (in decibels) of this 4 minute track is modeled by the graph of the function $y = f_1(t)$ at the time t minutes; the graph is given below:



Suppose Mike makes three successive 4 minute recordings of this track, after the original 4 minute track. Let $f_2(t)$, $f_3(t)$ and $f_4(t)$ represent the loudness (in decibels of each of the 4 minute recordings, with $f_2(t)$ 15% louder than $f_1(t)$, $f_3(t)$ 15% louder than $f_2(t)$ and $f_4(t)$ 15% louder than $f_3(t)$.

- Each function $f_i(t)$ is of the form $f_i(t) = A_i(t - h_i)$; find the constants A_i and h_i explicitly.
- Sketch the graph of

Summary

- Why?
- Function Arithmetic
- Graphs
- Domain & Range