

# University of Waterloo

## MATH 213, Spring 2015

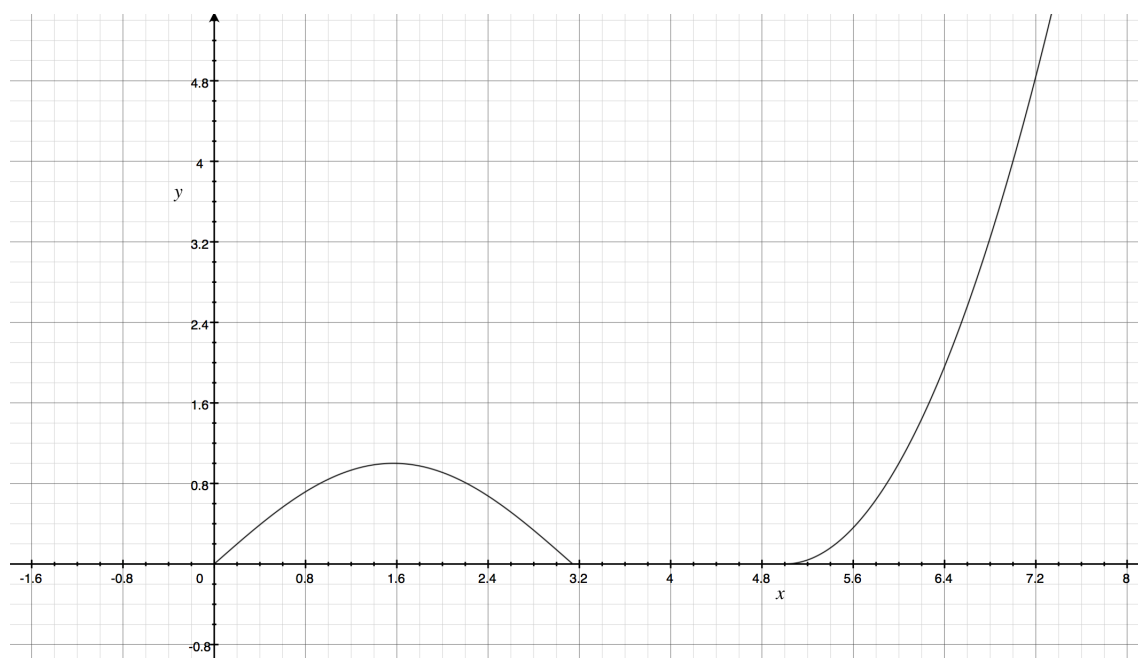
### Assignment 6

#### Question 1

a) Draw a labelled sketch of the following function.

$$f(t) = \sin t - \sin(t-2)H(t-2) + t^2 H(t-3)$$

b) Derive a single expression for  $f(t)$  from the following graph. Evaluate the transform.



#### Question 2

Use the Laplace transform to find the particular solution of the following functions

$$y' + y = \sin(t-3)u(t-3) + tu(t-3) - 3u(t-3)$$

Where

$$u(t) = \begin{cases} 0 & \text{when } t < 0 \\ 1 & \text{when } t \geq 0 \end{cases}$$