MTH101: Tutorial 9

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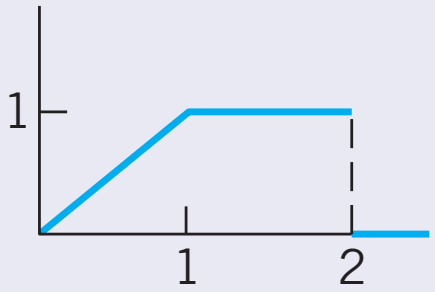
Exercise 1.1

Find the transform for the following functions.

1. $e^{-t}\sinh 4t$,

2. 

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Exercise 1.2

Given $F(s) = \mathcal{L}\left[f\right]$, *find* $f(t)$ *for the following functions.*

1. $\dfrac{4s+32}{s^2-16}$,

2. $\dfrac{4}{s^2-2s-3}$.

Exercise 2.1

Find $f(t)$ *if* $\mathcal{L}\left[f\right]$ *equals*

$$\frac{2\left(e^{-s}-e^{-3s}\right)}{\left(s^2-4\right)}.$$

Exercise 3.1

Find the solution to the initial value problem.

$$y'' + 4y' + 5y = \delta(t-1), \quad y(0) = 0,\ y'(0) = 3.$$

Exercise 3.2

Find the solution to the initial value problem.

$$y'' + 3y' + 2y = 10\left[\sin t + \delta(t-1)\right], \quad y(0) = 1,\ y'(0) = -1.$$

Exercise 4.1

Find $\mathcal{L}\left[f\right]$ *or* $\mathcal{L}^{-1}\left[F(s)\right]$ *for the following functions*

1. $\cos^2(2t)$,
2. $\dfrac{3s+4}{s^4+k^2s^2}$.