MTH 330 **Quiz #2** March 9, 2018

NAME: _____

1. Find the function $f(t)$ that satisfies:

$$f(t) = \mathcal{L}^{-1}\left[\frac{e^{-s} - e^{-4s}}{s^2 + 8s + 68}\right](t)$$

2. Use Laplace Transform techniques to solve the following IVP:

$$y'' + 4y' + 20y = f(t); \;\; y(0) = 0, \; y'(0) = 0$$

where the forcing function is given by:

$$f(t) = \begin{cases} 0 & 0 \leq t < 1 \\ 2 & t \geq 1 \end{cases}$$

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1. Find the function $f(t)$ that satisfies:

$$f(t) = \mathcal{L}^{-1}\left[\frac{e^{-s} - e^{-4s}}{s^2 + 6s + 58}\right](t)$$

2. Use Laplace Transform techniques to solve the following IVP:

$$y'' + 2y' + 65y = f(t); \;\; y(0) = 0, \; y'(0) = 0$$

where the forcing function is given by:

$$f(t) = \begin{cases} 0 & 0 \leq t < 2 \\ 5 & t \geq 2 \end{cases}$$

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1. Find the function $f(t)$ that satisfies:

$$f(t) = \mathcal{L}^{-1}\left[\frac{e^{-s} - e^{-2s}}{s^2 + 4s + 20}\right](t)$$

2. Use Laplace Transform techniques to solve the following IVP:

$$y'' + 6y' + 58y = f(t); \;\; y(0) = 0, \; y'(0) = 0$$

where the forcing function is given by:

$$f(t) = \begin{cases} 0 & 0 \leq t < 5 \\ 8 & t \geq 5 \end{cases}$$