

Quiz 4  
April 1, 2016

Show your work

[5] 1.) Define: The LaPlace transform of  $f = \mathcal{L}(f) =$

$$\int_0^{\infty} e^{-st} f(t) dt$$

[5] 2.)  $\mathcal{L}(0) =$  0

[10] 3.) Find a suitable form for  $\psi$  if the methods of undetermined coefficients is used for the following differential equations:

$$y'' - 4y' - 5y = 2e^t + 4e^{-t} + 3\sin(t) + 1 + t$$

$$r^2 - 4r - 5 = (r-5)(r+1) = 0 \Rightarrow r = 5, -1$$

$e^{5t}, e^{-t}$  are homy

Guess:

$$y = (Ae^t) + (Bte^{-t}) + (C\sin t + D\cos t) + (E + Ft)$$