

Student ID: Quiz 2

Name: SOLUTIONS

MA205B - Differential Equations I - Quiz 2

TUESDAY, NOVEMBER 6, 2012

1. Find  $\mathcal{L}\{4 + 3 \cos(7t) - 2 \sin(4t) + t^2\}$ .

$$= \frac{4}{s} + \frac{3s}{s^2 + 49} - \frac{8}{s^2 + 16} + \frac{2}{s^3}$$

for  $s > 0$

(4)

2. Suppose that  $f(0) = 4$  and that the Laplace transform of  $f(t)$  is

$$F(s) = \frac{2}{s^3 + s + 1}$$

a. Find  $\mathcal{L}\{e^{-5t}f(t)\}$ .

b. Find  $\mathcal{L}\{tf(t)\}$ .

c. Find  $\mathcal{L}\{f'(t)\}$ .

a. 
$$\frac{2}{(s+5)^3 + (s+5) + 1}$$

(2)

b. 
$$- \frac{dF}{ds} = \frac{2(3s^2 + 1)}{(s^3 + s + 1)^2}$$

(2)

c. 
$$sF(s) - f(0) = \frac{2s}{s^3 + s + 1} - 4$$

(2)