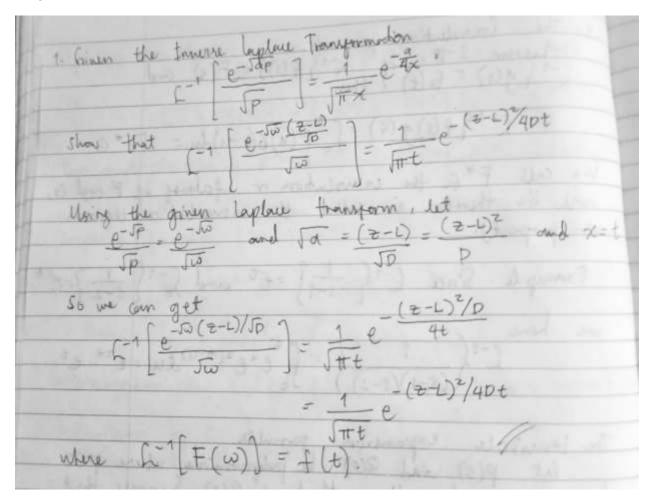
MESUGA, REYMOND R.

BS PHYSICS 3-1

PROBSET 1

PROBLEM 1



1 2 u'(0)=0	
(@ a y" +y" = et where y(e)=1 } y'(6)=0	6
£ (y) = Y(x)	
[\{y'\} = 5\forall \(\text{cs} \) - \forall \(\text{cs} \) - \foral	
£ {y"} = 52 y(s) - 5 y(o) - y'(o)	
	-
L{e ^t } = 1/s-1	
$ [s^{2}y(s) - sy(0) - y(0)] + sy(s) - y(0) = \frac{1}{s-1} $ $ [y(s)[s^{2} - s] + sy(s) - 1 = \frac{1}{s-1} $	
1 9 y(s) (s2-s] + s y(s)-1 = 1	
YOU 50-57+(YO) = 1+1 -5-1+1 -5	
$\frac{1}{\sqrt{(s)[s^2-s]+sy(s)}} = 1+\frac{1}{s^2} = \frac{s^2-1+1}{s^2} = \frac{s}{s^2}$ $\frac{1}{\sqrt{(s)[s^2-s+s]}} = \frac{s}{s^2-1} = \frac{s^2-1+1}{s^2} = \frac{s}{s^2}$	1
A .	
Y(s) [s2] = 5-1 -7 Y(s) {= (s-1)5	
1 = A + B	
(s-1)s s-1 + B	
1 = A(s) + B(s-1)	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	
4	
Y(s) = 1 - 1 S	
y(t) = (1{ y(s)}	
[-1{ Y(s)} = [-1{ 1 - 17	
1413	The second second
y(t)= et -1	

PROBLEM 2 B.

$$\frac{3}{4} = A \left(s^{2} + 9 \right) + \left(B c + C \right) \left(s - 1 \right)$$

$$\frac{3}{4} = A s^{2} + 9 A + B s^{2} - B s + C s - C$$

$$\frac{3}{5} = \left(A + B \right) s^{2} + \left(c - B \right) s + 9 A - C$$

$$0 = A + B \Rightarrow A = \frac{2}{10} + B = -\frac{3}{10}$$

$$0 = c - B \Rightarrow C = \frac{3}{10}$$

$$3 = 9 A - C \Rightarrow$$

$$A = \frac{3 + C}{9} + C = 9 A - 3$$

$$y(s) = \frac{(3/10)}{s-1} + \frac{(-3/10)}{s^2+9} + \frac{3}{10}$$

$$y(s) = \frac{3}{10} \left(\frac{1}{s-1}\right) + \left(\frac{3}{10}\right) \left(\frac{s}{s^2+9}\right) + \frac{3}{10} \left(\frac{1}{s^2+9}\right)$$

$$y(t) = \frac{3}{10} \left(e^{t}\right) + \frac{3}{10} \left(\cos 3t\right) + \frac{1}{10} \left(\sin 3t\right)$$