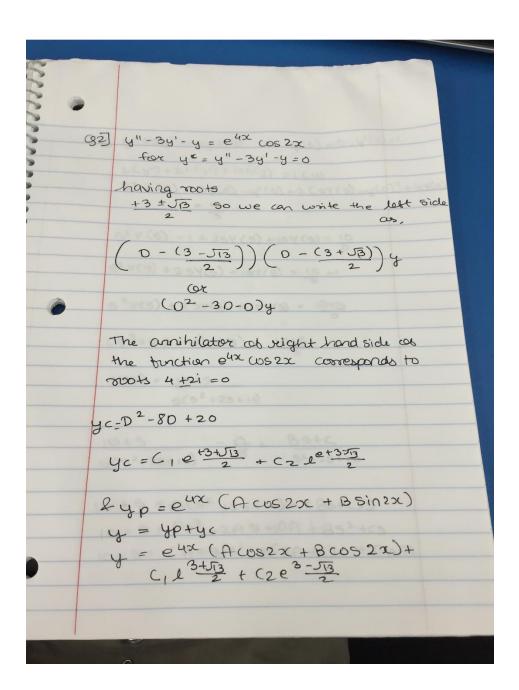
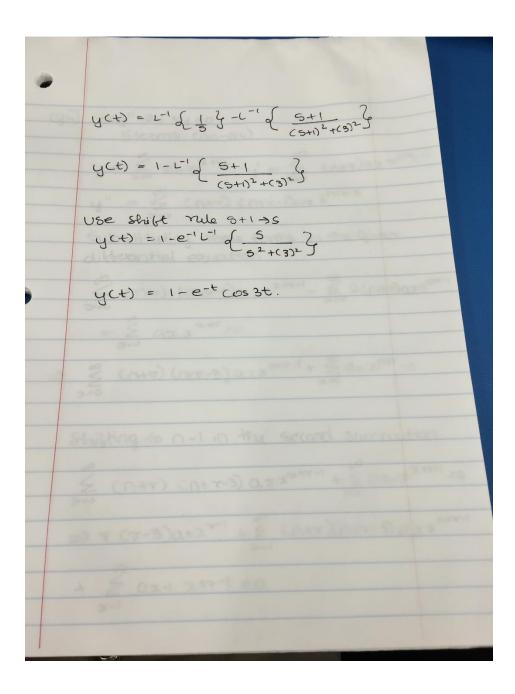
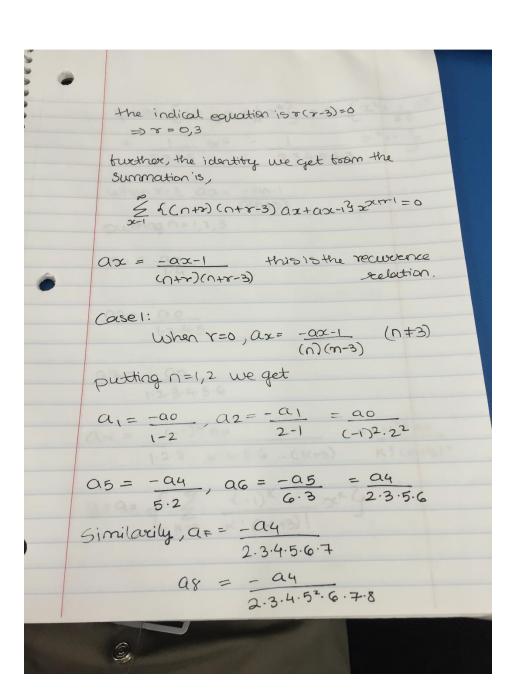
	findl Exam Jay Patel
3	we can use Standard velocity acceleration as given constant V = V0+Sadt V = V0+at
	Cus acceleration is constant in 50's it reaches $3 \text{ km} = 3000 \text{ m}$ $50 = 10 + 0.5 \text{ ka} + 1^2$ $3000 = 15 \text{ k50} + 0.5 \text{ k50}^2 \text{ ka}$ $a = 1.8 \text{ m/s}^2$ V = 15 + 1.8 k50 = 15 + 90
	= 108mls



compare coefficient	
constat: 10A \$ 10=>A=1	
S 2A+C=1	
5 2A+C=1 2CO+C=1	
C = \-2	
C = -l	
52 = A+B =0	
B=-A	-
0 = -1	
-> 10+5 = 1 + -S-1	
$\Rightarrow 10+5 = \frac{1}{5} + \frac{-5-1}{5^2 + 25 + 10}$ $5(5^2 + 25 + 10)$	
5(5 +25+10)	
$Y(5) = \frac{1}{5} + \frac{-5-1}{5^2 + 25 + 10}$	
52+25+10	
$Y(5) = \frac{1}{5} + \frac{5+1}{5^2 + 28 + 10}$	
5 - 2 - 2 + 10	
5 +25 10	
(C) = 1 = S+1	
$\gamma(s) = \frac{1}{5} - \frac{s+1}{(s+1)^2 + (3)^2}$	
(S+1) 1(3)	
- Landon	0.0
ake inverse laplace transform,	we go



(84) $xy''-2y'+y=0$ 5 tetms (ao-au) $y = \sum_{x=0}^{\infty} a_x x^{x+y} y' = \sum_{x=0}^{\infty} (n+s)a_x x^{x+y-1}$ $y'' = \sum_{x=0}^{\infty} (n+r) (n+s-1)a_x x^{n+r-2}$ Substituting these terms in the given differential equation $\sum_{x=0}^{\infty} (n+s) (n+r-1)a_x x^{x+r-1} - \sum_{x=0}^{\infty} 2(n+s)a_x x^{x+r-1}$ $\sum_{x=0}^{\infty} (n+s) (n+r-1)a_x x^{x+r-1} - \sum_{x=0}^{\infty} 2(n+s)a_x x^{x+r-1}$ $\sum_{x=0}^{\infty} (n+s) (n+r-1)a_x x^{x+r-1} - \sum_{x=0}^{\infty} 2(n+s)a_x x^{x+r-1}$	
$\Rightarrow \underset{x=0}{\overset{\infty}{\sum}} (n+\sigma) (n+\sigma-3) ax x^{2+\sigma-1} + \underset{x=0}{\overset{\infty}{\sum}} ax x^{n+\sigma} = 0$	
Shifting to $n-1$ in the second summation $ \overset{\circ}{\underset{x=0}{\text{E}}} (n+r) : (n+r-3) : \text{ax} x^{x+r-1} + \underset{x=1}{\overset{\circ}{\underset{x=1}{\text{E}}}} \text{ax} - x^{x+r-1} = 0 $ $ \Rightarrow r (r-3) : \text{ao} x^{r-1} + \underset{x=1}{\overset{\circ}{\underset{x=1}{\text{E}}}} (n+r) : (n+r-3) : \text{ax} x^{n+r-1} $ $ + \underset{x=1}{\overset{\circ}{\underset{x=1}{\text{E}}}} (1 + x^{r-1}) = 0 $ $ x-1 $	



$$y = 00 \text{ of } 1 + \frac{1}{2}x + \frac{1}{4}x^{2}y + au_{0}(x^{4}x + \frac{1}{2}x^{5})$$

$$+ \frac{1}{a \cdot 3 \cdot 5 \cdot 6} - \frac{1}{2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7} \times^{7} + \cdots \cdot \frac{7}{6}$$

when $\tau = 3$, $ax = -an - 1$

$$n(n+3)$$

putting $n = 1, 2, 3$

$$a_{1} = -a_{0}$$

$$1 \cdot 2 \cdot 4 \cdot 5$$

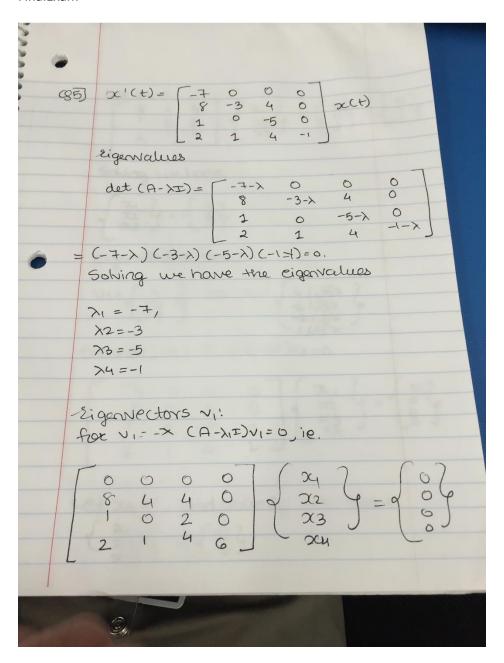
$$a_{2} = a_{0}$$

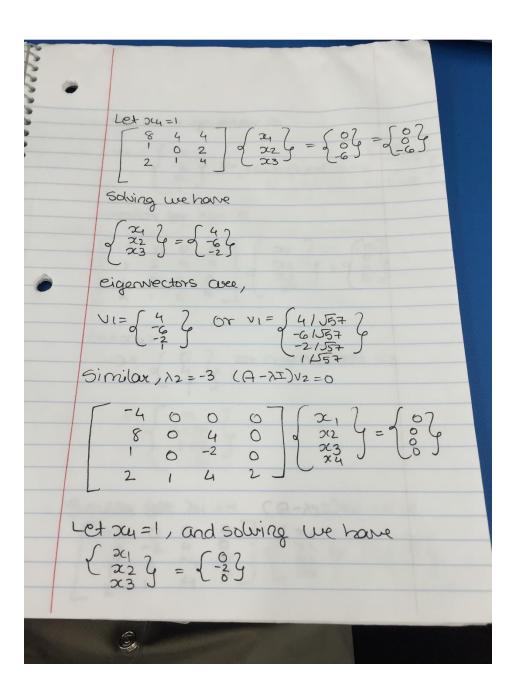
$$1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6$$

$$a_{K} = (-1)^{K} a_{0}$$

$$1 \cdot 2 \cdot 3 \cdot K \cdot 4 \cdot 5 \cdot 6 \cdot (K+3) \quad K! (K+3)!$$

$$y = a_{0} \begin{cases} 2 \\ K = 0 \end{cases} \quad K! (K+3)!$$





So
$$V_2$$
 eigenvector is

$$V_2 = \begin{cases} 0 \\ -2 \\ 0 \end{cases} \text{ or normalized } v_2 = \begin{cases} -2/35 \\ -2/35 \end{cases}$$

Similar for $\lambda_3 = -5$

$$\begin{bmatrix} -2 & 0 & 0 & 0 \\ 1 & 2 & 0 \\ 1 & 0 & 0 \\ 2 & 1 & 4 \end{bmatrix} \begin{cases} 24 \\ 23 \\ 24 \end{cases} = \begin{cases} 0 \\ 0 \\ 21 \end{cases}$$

Let $x_4 = 1$

$$V_3 = \begin{cases} 0 \\ 4/324 \\ -2/324 \\ 1/321 \end{cases}$$

Similar for $\lambda_4 = 1$ (A- λ_4 I)V4 = 0 ie

$$\begin{bmatrix} -6 & 0 & 0 & 0 \\ 8 & -2 & 4 & 0 \\ 1 & 0 & 0 \\ 2 & 1 & 4 & 0 \end{bmatrix} \begin{cases} 24 \\ 23 \\ 24 \end{cases} = \begin{cases} 0 \\ 0 \\ 24 \end{cases}$$

