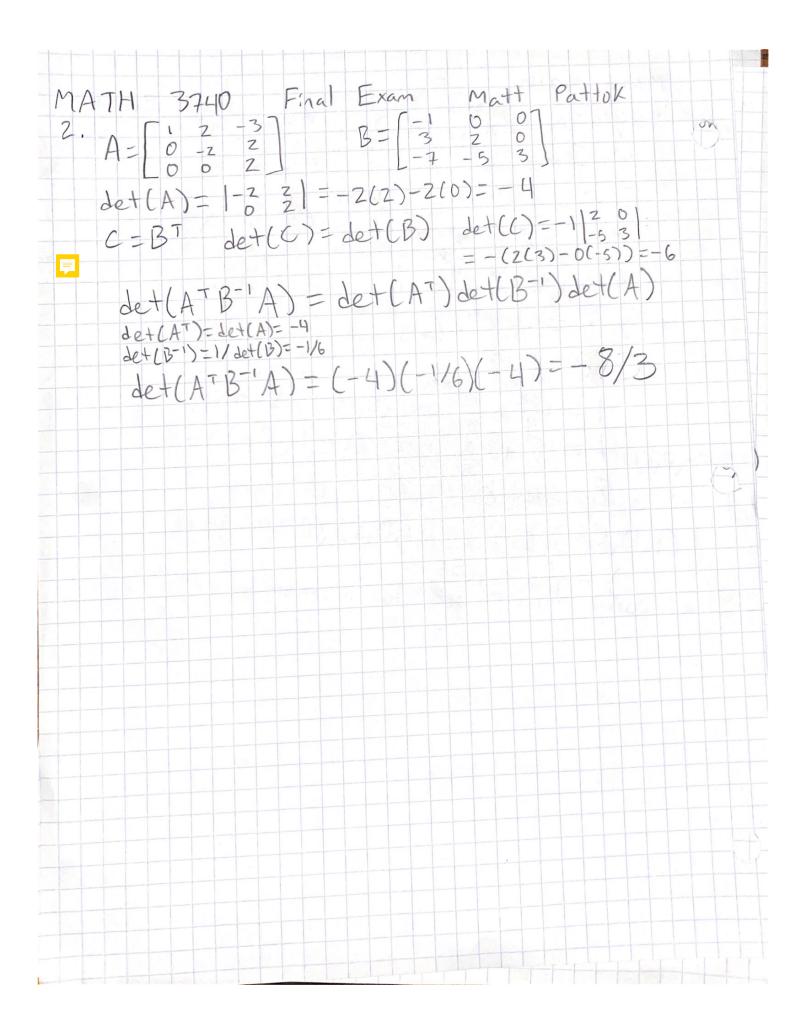
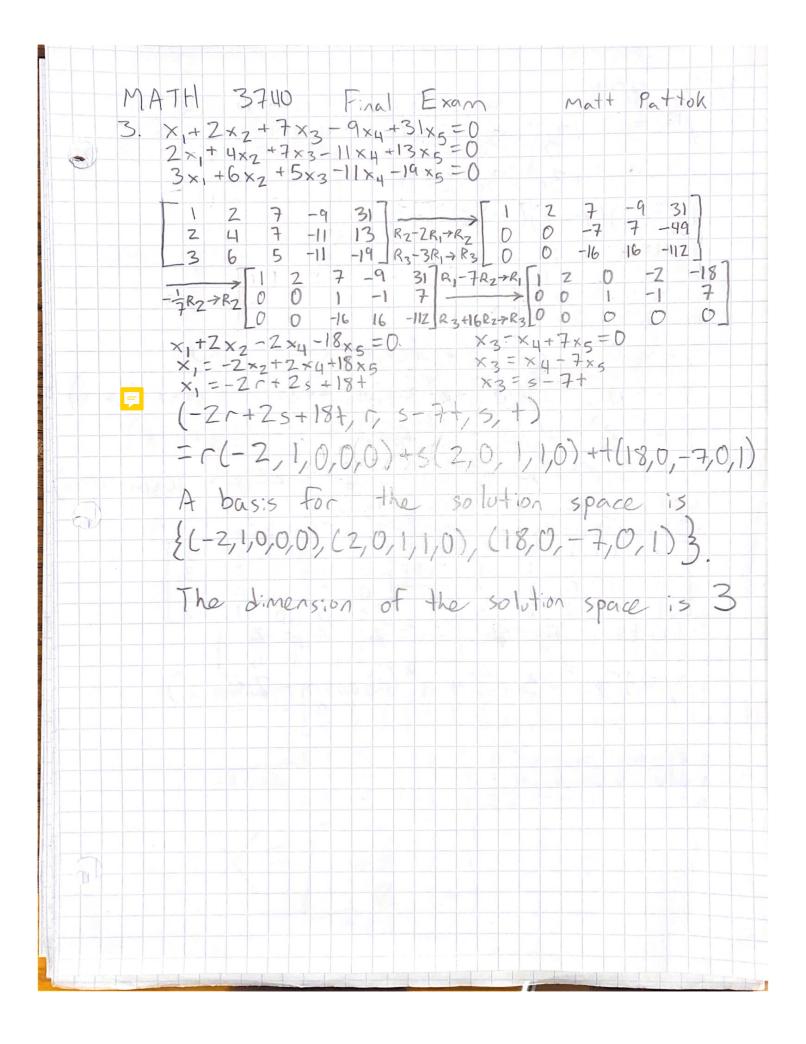
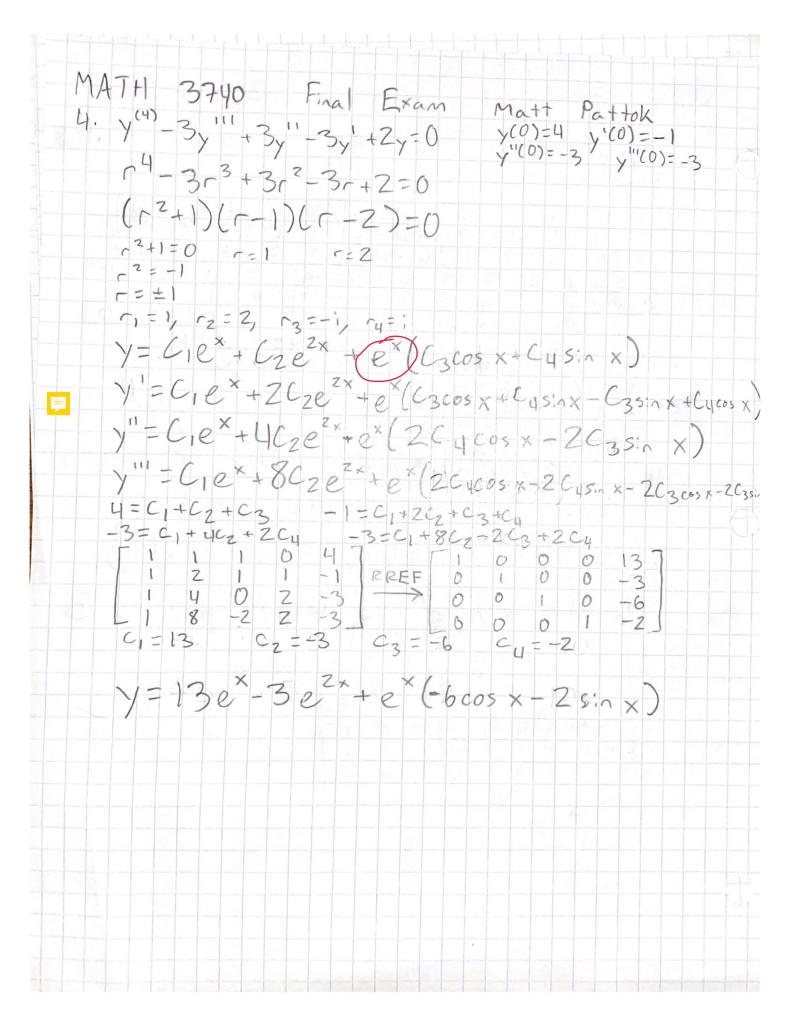
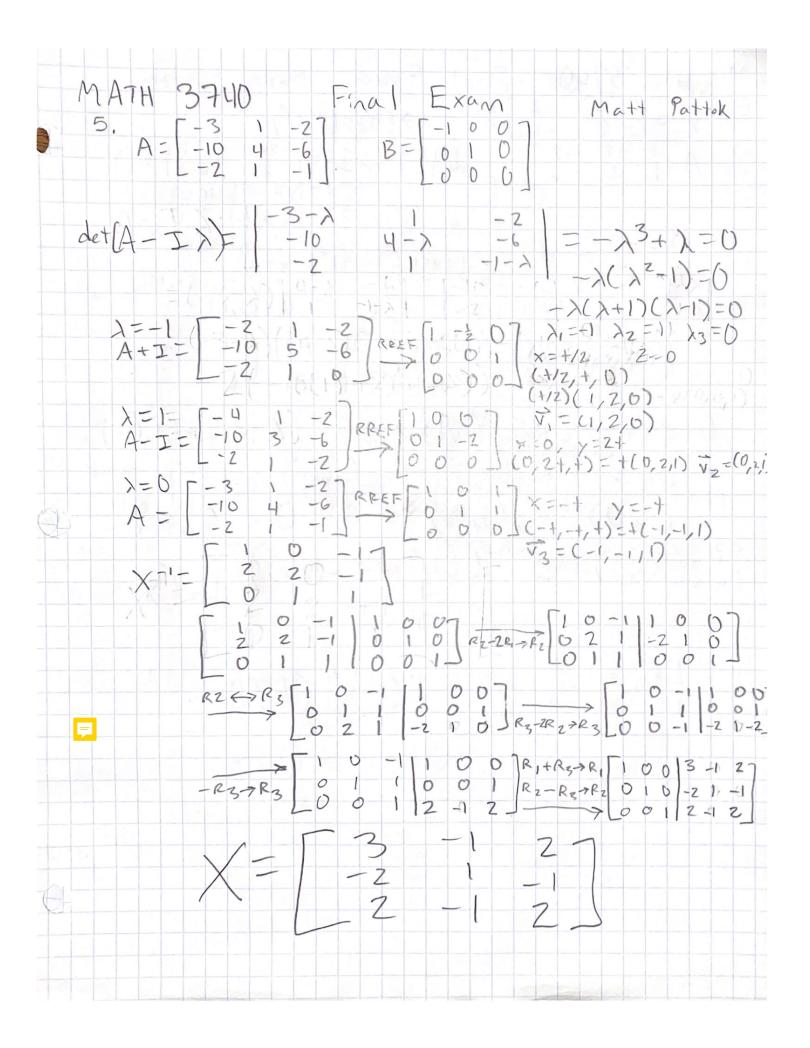
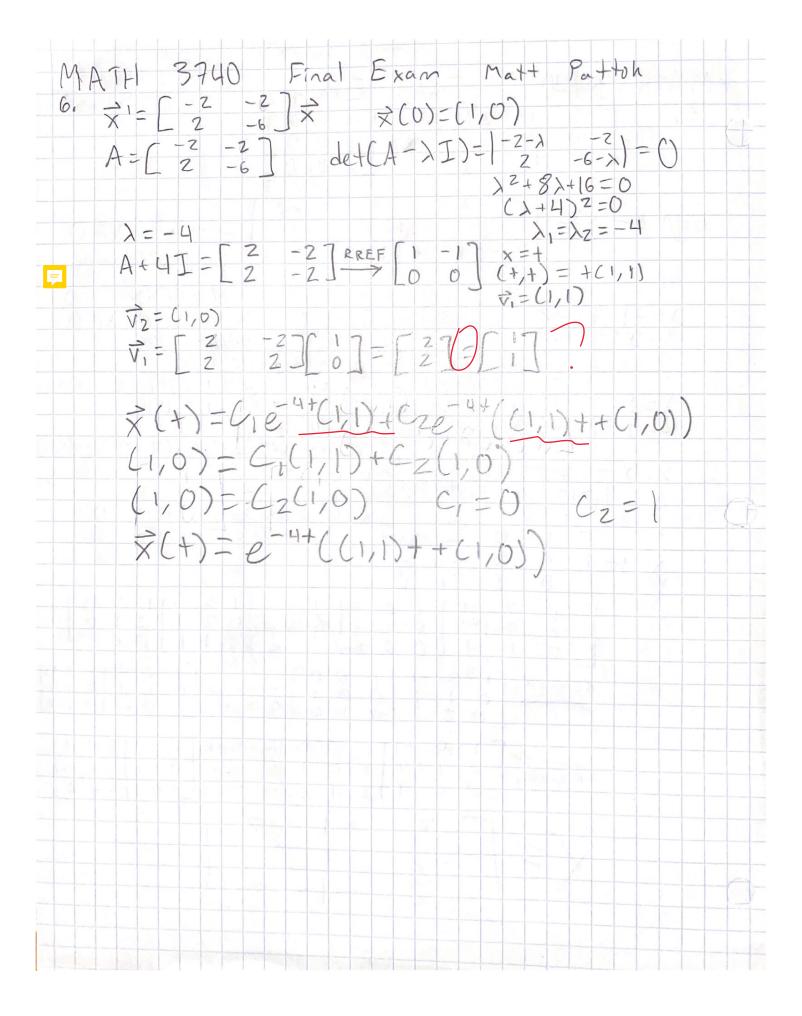
1. xy + 3y = 2x5 y(2)=1 Matt Pattok $y' + \frac{3}{x}y = \frac{2}{x}$ $y' + \frac{3}{x}y = \frac{2}{x}$ $(x') = e^{53/x} dx = e^{31/x} = e^{1/x} = x^3$ 56 ×3

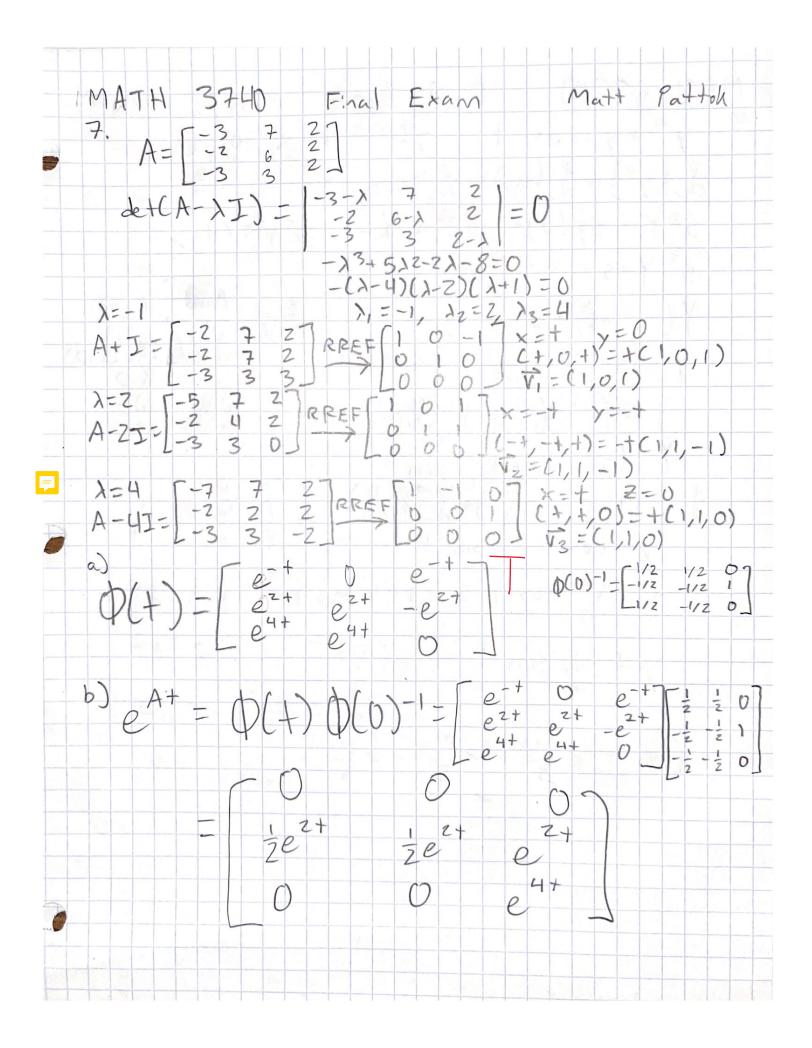












Final Exam Matt Patton y(0)=-1 y'(0)=0 52 Y - 5y (0) - y'(0) + Y = 5247 S AS+B CS+D (s2+1)2 = s2+1 S= (57+1) (A5+B+ C5+D) A=A+C B=B+D S=(s2+1)(As+B) $Y = \left(\frac{5}{3^2+1}\right)\left(\frac{5}{3^2+1}\right) - \frac{5}{5^2+1}$ 5= A53+B52+A5+B $Y = \left(\frac{5}{5^2+1}\right)\left(\frac{1}{5^2+1}\right) = \frac{5}{5^2+1}$ 20 2-1(Y)=2-1(5) * 2-1(1) - 2-1(5) y = cos + * sin + - cos + $y = S^+ \cos \tau \sin(t-\tau) d\tau - \cos s$ 750

Final Exam Matt Pattoh 9. $(2 \times +1)$ $y^{1} + 3y = 0$ $y = \sum_{n=0}^{\infty} C_{n} \times^{n} y^{n} = \sum_{n=1}^{\infty} n C_{n} \times^{n-1}$ $\sum_{n=1}^{\infty} 2nc_n x^n + \sum_{n=1}^{\infty} nc_n x^{n-1} + \sum_{n=0}^{\infty} 3c_n x^n = 0$ $\sum_{n=0}^{\infty} 2nc_n x^n + \sum_{n=0}^{\infty} (n+1)c_{n+1} x^n + \sum_{n=0}^{\infty} 3c_n x^n = 0$ For $n \ge 0$, $2nc_n + (n+1)c_{n+1} + 3c_n = 0$ $-2nc_n + 3c_n = 0$ $-2nc_n + 3c_n = 0$ $-2nc_n + 3c_n = 0$ $c_{1} = -\frac{3c_{0}}{1} = -\frac{3c_{0}}{1}$ $c_{2} = -\frac{5c_{1}}{2} = -\frac{15}{2}c_{0}$ $c_3 = -\frac{7c_2}{3} = -\frac{36}{5}c_0$ $C_{11} = \frac{903}{4} = \frac{315}{8} = \frac{315}{2} \times \frac{315}{2} \times \frac{4}{8} \times \frac{4}{10} + \frac{115}{2} \times \frac{35}{2} \times \frac{315}{8} \times \frac{4}{10} + \frac{115}{2} \times \frac{35}{2} \times \frac{35}$

MATH 3740 Final Exam Matt Pattok 10. y' = x + 3y y(1) = 3 $y_1 = 3 + 5(1 + 9)d + = 3 + [\frac{1}{2} + 9 +]^{\times}$ $=3+\frac{x^2}{2}+9x-\frac{1}{2}-9=\frac{1}{2}x^2+9x-\frac{13}{2}$ Yz=3+5,(++3(=+2+9+-13))d+ $=23+((\frac{3}{2}+2+28+-\frac{39}{7})d+$ = 3 + [= +3 + 14+2 - 39 +] = 3+=x3+14x2-39x-1-14+39 - 2x3+14x2-39x+9V y3=3+5 (++3(=+3+1+2-39++8))2+ = 3+(x/3+3+42+2-115++24) d+ = 3 + [3 +4+14+3-118+2+24+] x = 3 + 3 x 4 + 14 x 3 - 115 x 2 + 24 x - 3 - 14 + 115 - 24 - 3 x4+14x3-118x2+24x-13 yu=3+5,(++3(3+++14+3-115+2-9+-13))d+ = 3 + 5 × (9 +4 + 42 +3 - 345 +2 - 26+ 39) d+ = 3+[9 +5 +21 +4 115 +3 -13+2 -39 +]+ 3+9+5+21+4-115+3-13+2-39+9-21+115+13+39 $-\frac{a}{40} + 5 + \frac{21}{2} + 4 - \frac{115}{4} + \frac{3}{3} - 13 + \frac{201}{8} + \frac{2140}{40}$