

```

x =
    2
   -1
    0

-----
try n = 6:
n =
    6
A =
    1    2    0    0    0    0
    1    0    4    0    0    0
    0    1    0    4    0    0
    0    0    1    0    4    0
    0    0    0    1    0    4
    0    0    0    0    0    1
b =
    0
    2
    3
    4
    5
    0
condA =
   177.0559
x =
   34
  -17
   -8
    5
    3
    0
*** May have an error of 18%

```

Additional m-File: solvesys.m

```

% relative error in the data
relErrData=0.001;

% initialize the matrix
A=zeros(n);
b=zeros(n,1);

% set row i = 1
A(1,1)=1;
A(1,2)=2;

% set rows i = 2 to n-1
for i=2:n-1
    A(i,i-1)=1;
    A(i,i+1)=4;

```

- ③ initialize A, b
- ⑤ ~~add~~ ^{give} individual coefficients values
- ④ for loop (also in q2)
- ③ show A, b, x and no junk
- ② find cond(A)
- ③ singularity condition
- ④ if statements (also in q2)
- ⑤ solve $Ax=b$ as $A \setminus b$
- ③ inaccuracy condition
- ② fprintf (also in q2)

Give back to Lvd

Dr. Leon VanDommelen, Exam 2, 11/08/18, Question 2

Table of Contents

Initialize 1
My Solution: 1

IMPORTANT:

Do not change **anything** in this header! Put the solution to the question completely at the end of the file.

Initialize

```
format compact  
more off
```

My Solution:

```
% set the worst case x  
x=1-1/sqrt(2);  
  
% maximum number of terms we will ever sum  
iMax=500;  
  
% initialize the sum to the first term  
ti=x;  
total=ti;  
  
% add more terms until the sum no longer improves  
for i=2:iMax  
    % compute the new term from the previous value  
    ti=ti*x*((i-1)/i);  
    % remember the current sum  
    totalOld=total;  
    % add the new term  
    total=total+ti;  
    % if no change, stop summing  
    if total==totalOld  
        break  
    end  
end  
if total~=totalOld  
    disp('*** WARNING: Sum did not converge!')  
end  
  
% analyze the results  
exact=log(sqrt(2));
```

Handwritten notes:

- ② initialize x
- ⑤ initialize sum to t_1
- ③ for loop (or while)
- ② limit on i , 500
- ⑤ compute t_i from t_{i-1}
- ③ if statements not converged or break
- ④ break check (know how to end loop)
- ⑤ ~~if not converged~~ if ~~not converged~~ ^{yes} ~~not converged~~
- ④ fprintf the data

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Dr. Leon VanDommelen, Exam 2, 11/08/18, Question 3

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Initialize	1
My Solution:	1

IMPORTANT:

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Initialize

```
format compact
more off
```

My Solution:

```
% Find the partial fraction expansion of a ratio
disp('Analyze a Laplace transform:')
disp(' ')
syms s
ratSym=(s^3+s^2+s+1)/(s^4-2*s^3-14*s+15)
disp(' ')
factors=prod(factor(ratSym))
disp(' ')
partFrac=partfrac(ratSym)
disp(' ')

% Find the roots of the lemniscate
disp('Roots of the lemniscate:')
syms x y
disp(' ')
ySol=solve((x^2+y^2)^2==x^2-y^2,y)
disp(' ')

% integrate a function
disp('Antiderivative of a function:')
syms a x
disp(' ')
f=1/sqrt(a^2-x^2)
disp(' ')
F=int(f,x)
disp(' ')
valSym=subs(F,{a x},{1 1/sqrt(2)})
disp(' ')
FNum=matlabFunction(F)
```

Syms
 3) form symbolic expressions
 ③ "factor"
 ⑤ "partfrac"
 ⑥ "solve"
 ③ "solve for y"
 ② "int"
 ② "subs"
 ② "matlabFunction"
 ② "evaluate"
 ② "vpa"
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Syms
 form symbolic expressions
 "factor"
 "partfrac"
 "int"
 "subs"
 "matlabFunction"
 "evaluate"
 "vpa"