**Assignment 1 CSU33081 October 2020**

Please answer where asked by entering A to E as appropriate and upload this document along with your typewritten solutions (as a separate document) via Blackboard. Both documents should be in .pdf format.

Q1.

How would we represent the summation of the following two polynomials in MATLAB?

and

Choose your answer from the following:

1. [-6 2 2]+[-4 2 1]
2. [2 2 -6]+[1 2 4]
3. [2 2 2 -6]+[1 0 2 -4]
4. [2 2 -6]+[1 2 -4]
5. None of these

Answer: E

The right answer is [2 2 -6] + [1 0 2 -4]

Q2.

What is the final value of the matrix A when the following MATLAB commands are executed?

A=eye(3,3);

for x=1:2:3

A(1,x)=1;

End

Choose your answer from the following:

1. None of these

Answer: B

When I executed the above command in MATLAB, I got the value of B.

Q3.

What is the displayed result when the following MATLAB script file is executed?

x=[6:8;-1:1;567];

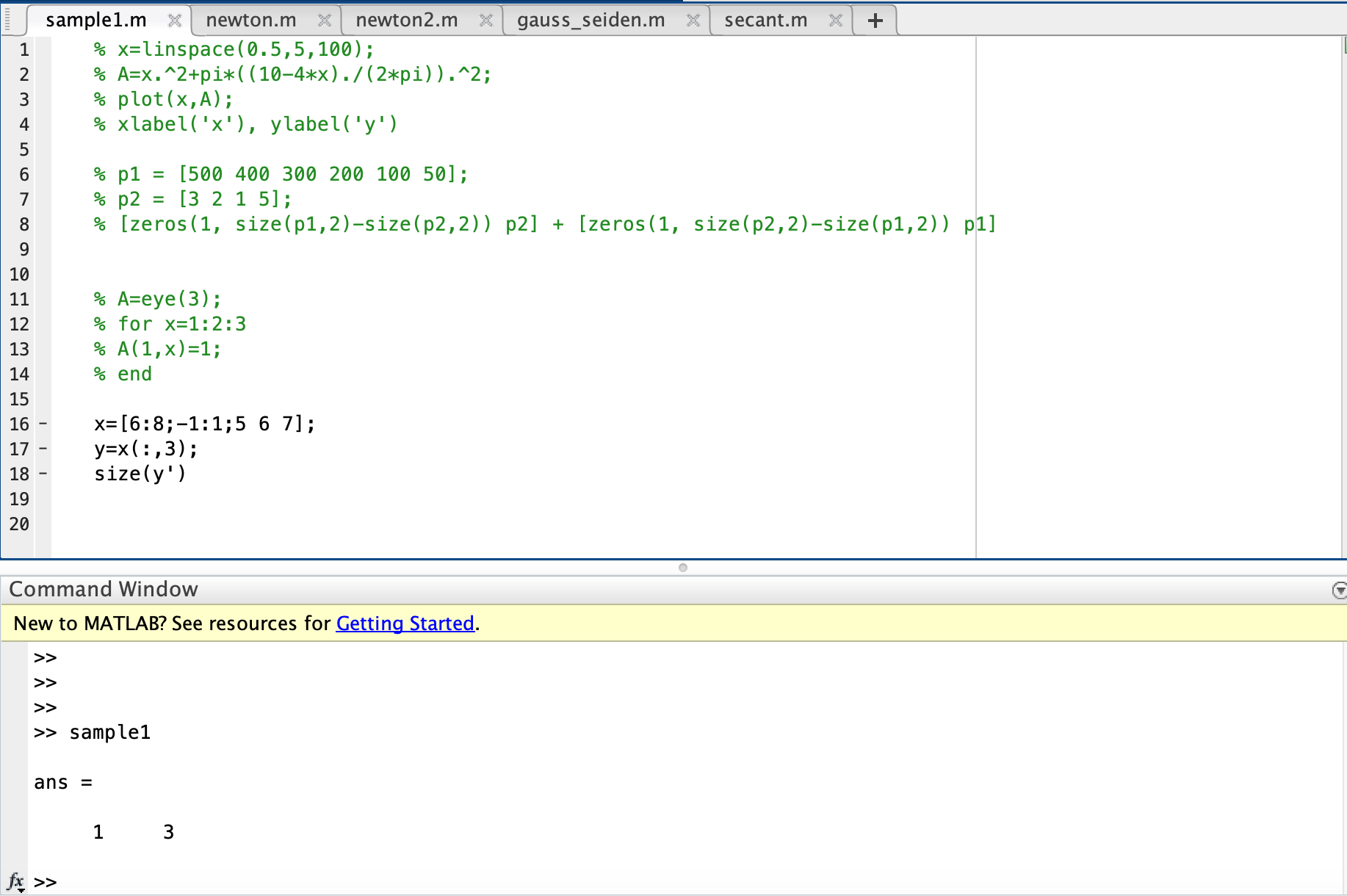
y=x(:,3);

size(y’)

Choose your answer from the following:

1. 1 1
2. 3 1
3. 1 3
4. 3 3
5. None if these

Answer: C

When I typed the above command, I got the value of C. 

Q4.

Calculate the Truncation Error, at , in approximating the function   
For the approximation use the Taylor Series polynomial approximation of degree two, , expanded about the point

Choose your answer from the following:

1. -7.182755
2. -7.645227
3. -4.358405
4. -7.994173
5. None of these

Answer: E

f(x) = 3-17x^3 = -17x^3 + 3

f’(x) = -51x^2

f’’(x) =-102x

At X0 = 2.0

P2(x) = f(x0) + f’(x0)/1! (x-x0) + f’’(x0)/2!(x-x0)^2

f(2.0) = 3 – 17(2.0)^3 = -133

f’(2.0) = -51 (2.0)^2 = -204

f’’(2.0) = -102(2.0) = -204

Thus,

P2(x) = f(x0) + f’(2.0)/1! (x-2.0) + f’’(2.0)/2!(x-2.0)^2

= -133 +(-204)/1! (x-2.0) +(-204)/2!(x-2.0)^2

= -133 – 204x + 408 – 102x^2 + 408x – 408

= -102x^2 + 204x -133

f(2.5) = 3 -17(2.5)^3 = -262.625

P2(2.5) = -102(2.5)^2 + 204(2.5) -133 = -260.5

Therefore,

Truncation error = f(2.5) - P2(2.5) = -260.5 – (-262.625) = 2.125

Q5.

Use the Secant Method to find a root of the function

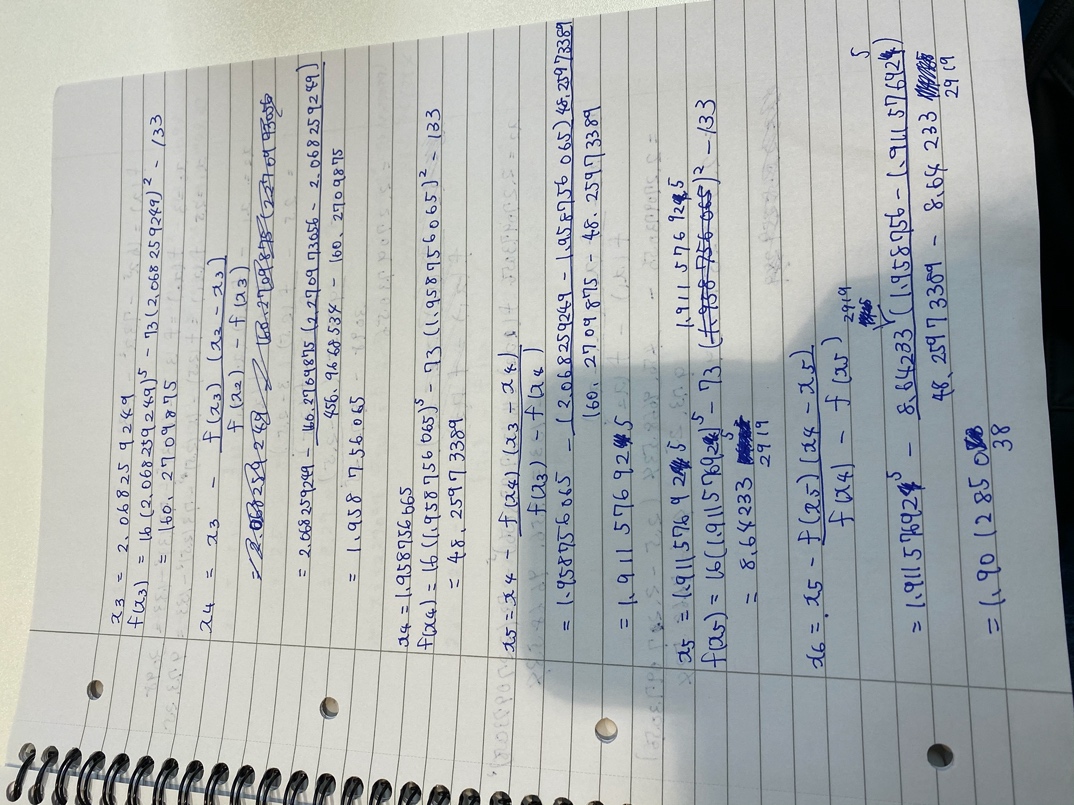
accurate to within an error of , where is the value of at the iteration. Use starting points and

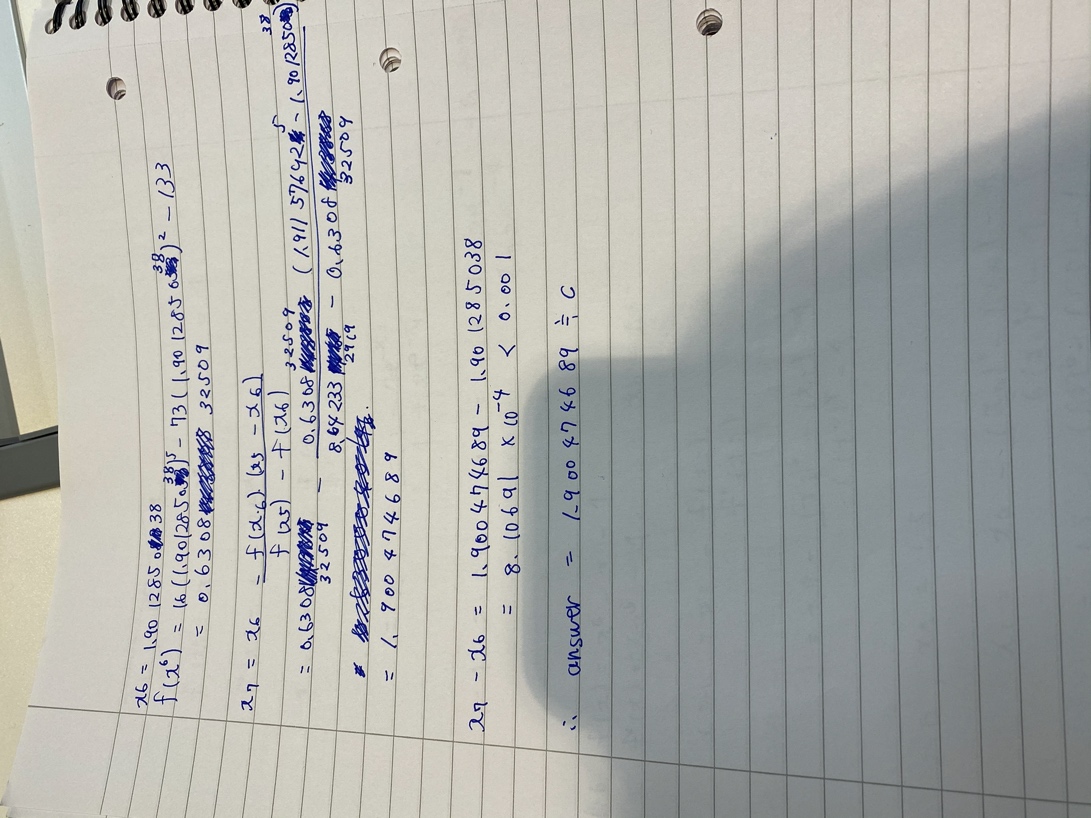
Choose your answer from the following:

1. 0.982274
2. 0.342803
3. 1.900475
4. 1.513896
5. None of these

Answer: C







Q6.

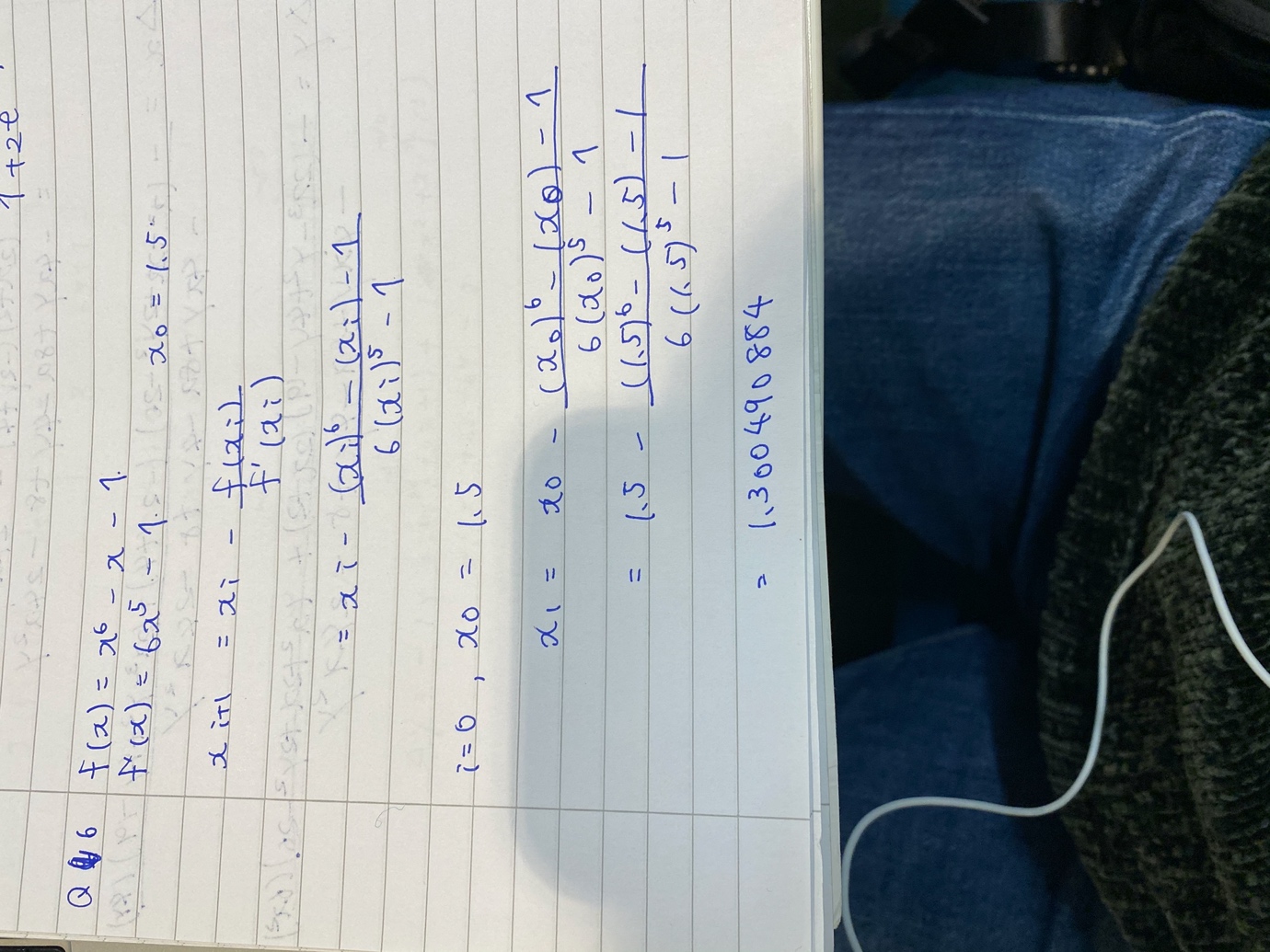
Use Newton-Raphson’s Method to find a root of the equation:

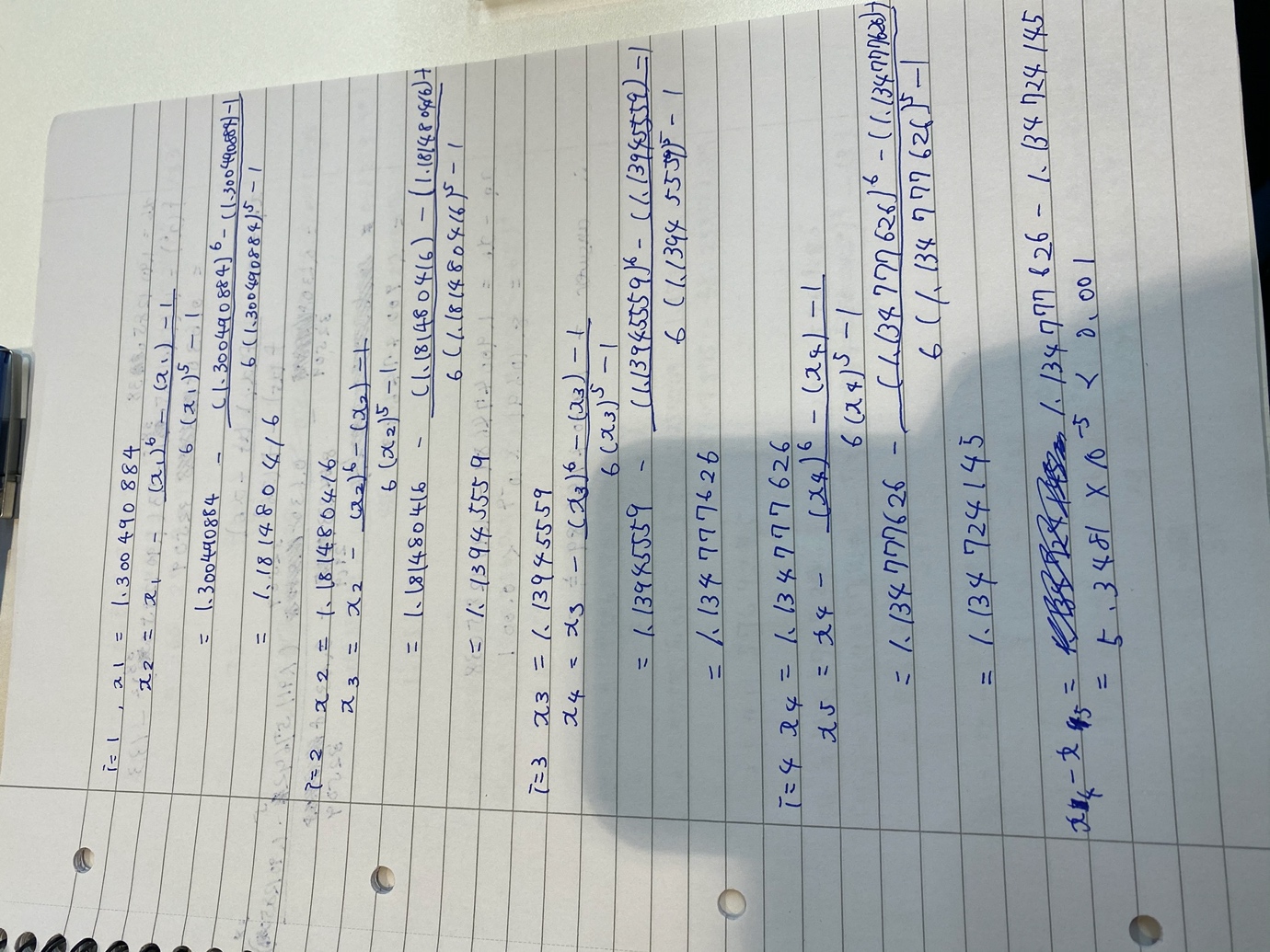
accurate to within an error of , where is the value of at the iteration. Use a starting point of

Choose your answer from the following:

1. 1.134778
2. 0.616384
3. 1.505056
4. 1.160489
5. None of these

Answer: A





Q7.

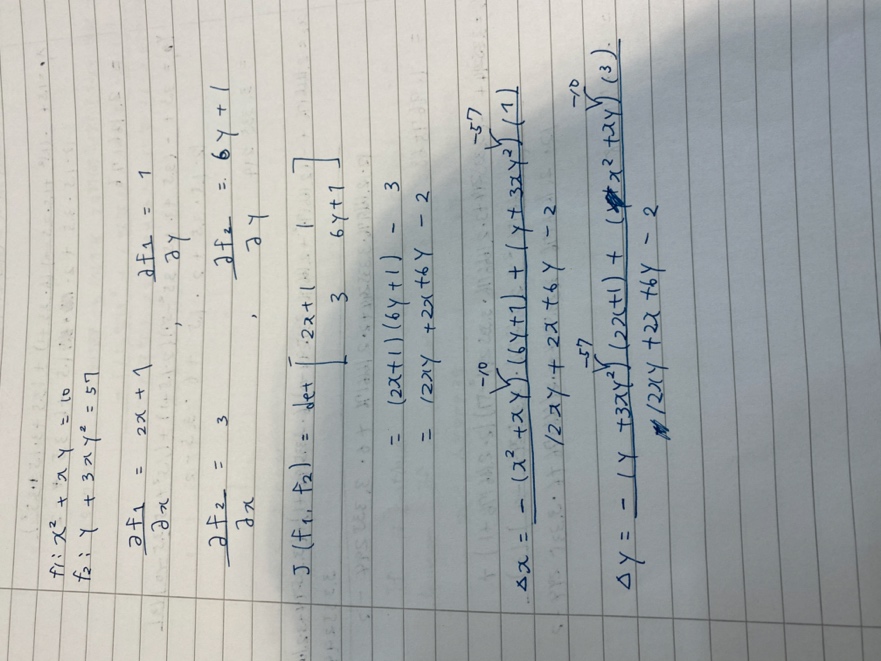
Use Newton’s Method to solve the following equations for and . Perform three iterations.

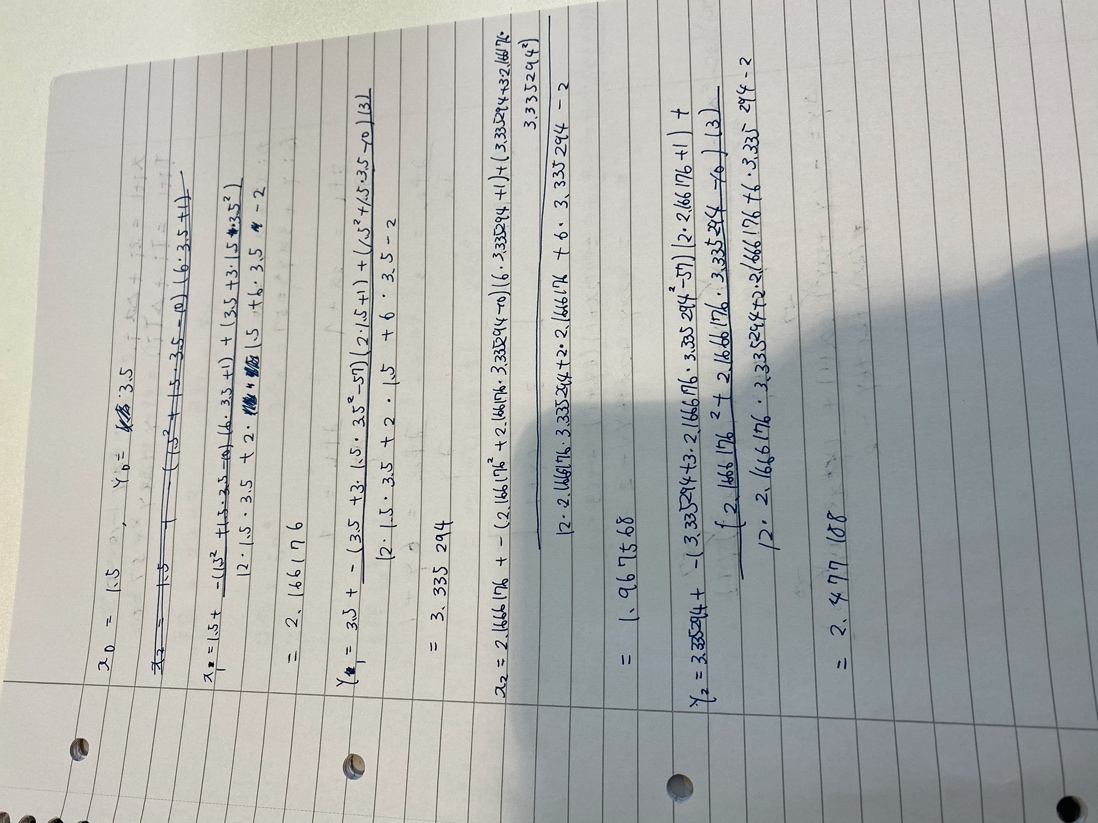
You should use an initial guess of and . Perform three iterations.

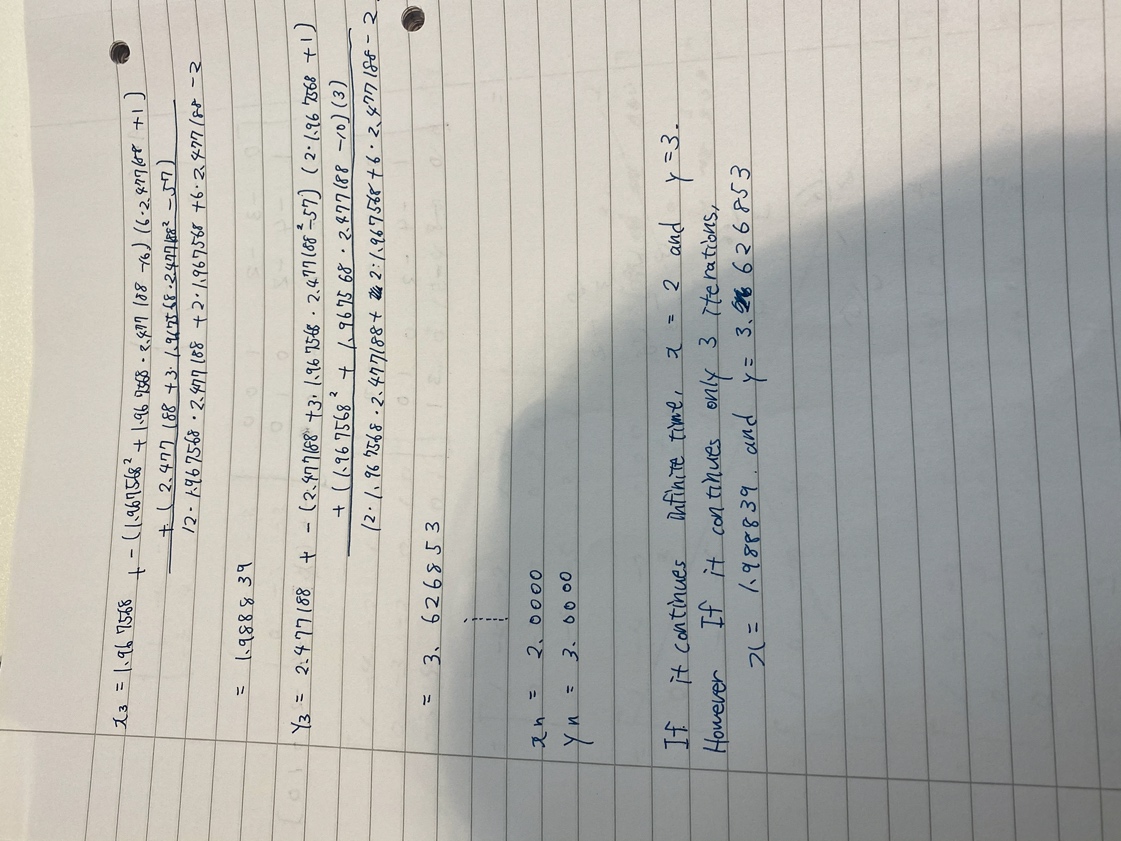
Choose your answer from the following:

1. None of these

Answer: E







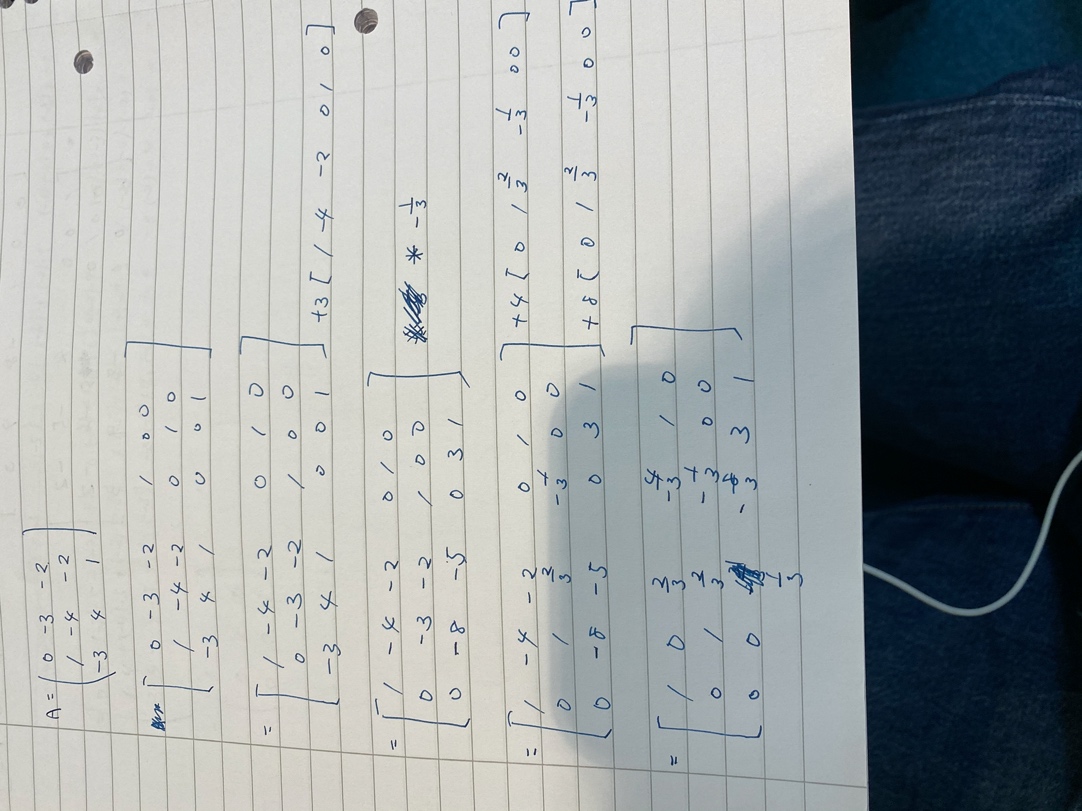
Q8.

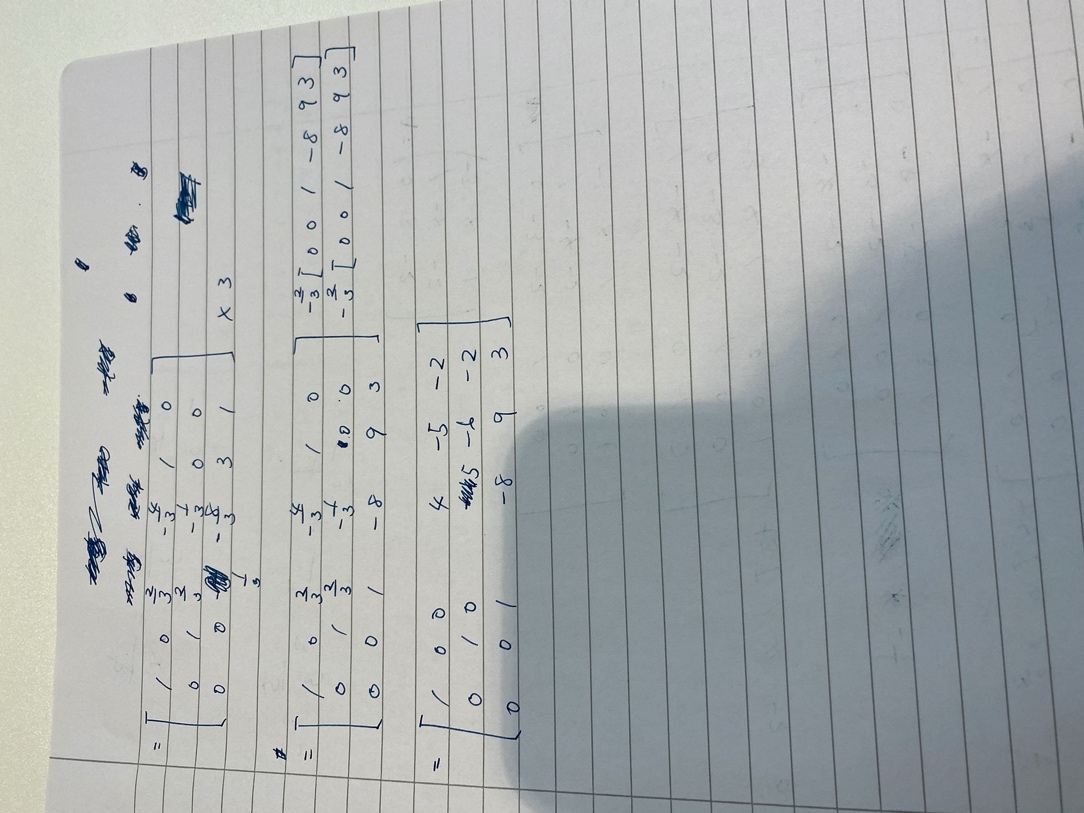
Find the inverse of the following matrix using the Gauss-Jordan Method:

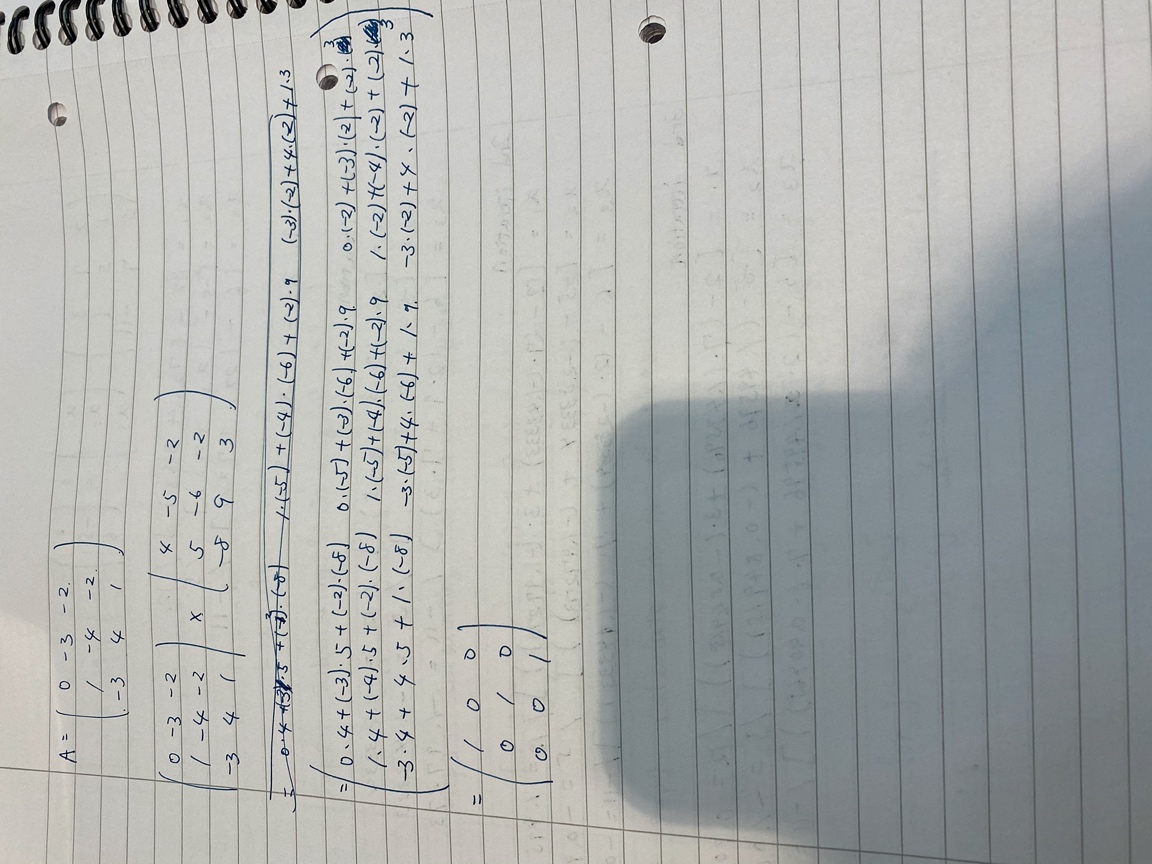
Choose your answer form the following:

1. None of these

Answer: D







Q9.

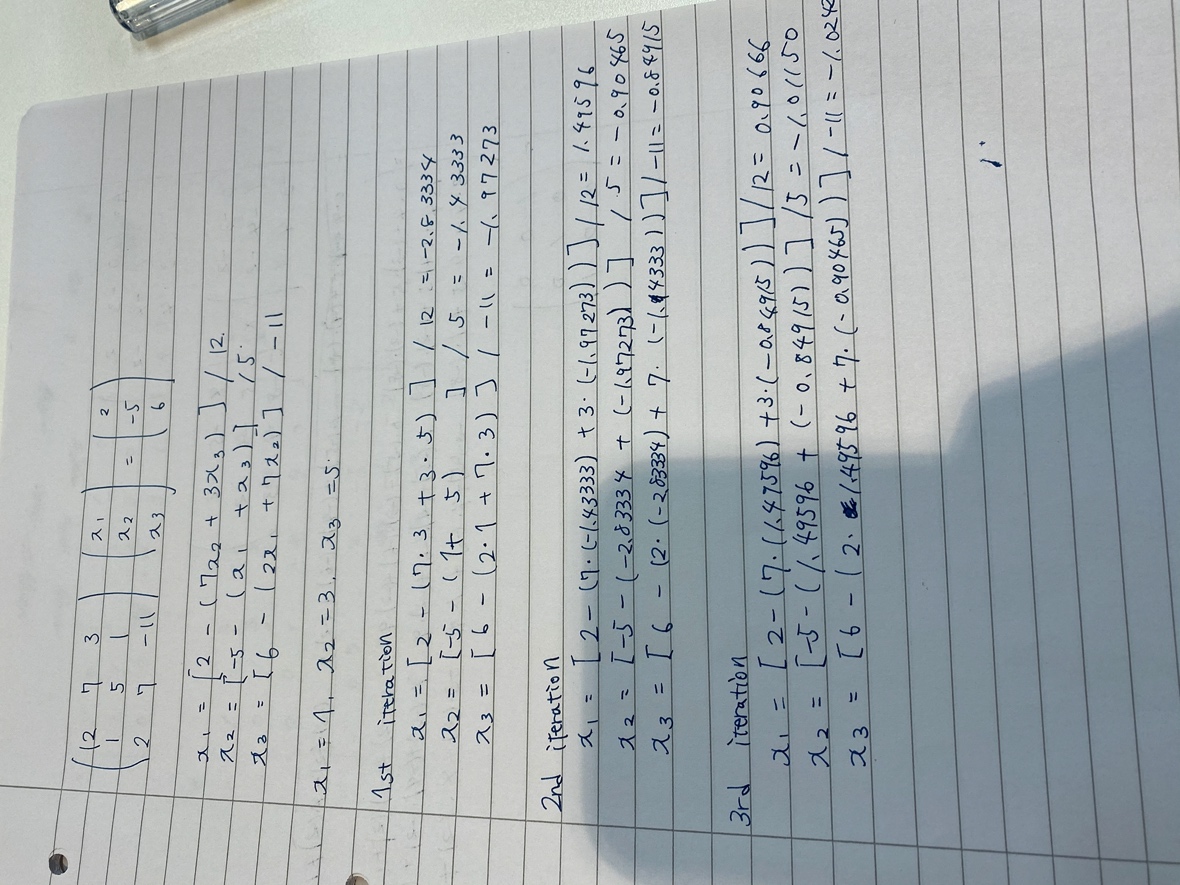
Using , as an initial guess at the solution, determine the values of , and that result from three iterations of the Gauss-Seidel method applied to this matrix equation:

=

Choose your answer from the following:

1. ,
2. ,
3. ,
4. ,
5. None of these

Answer: C



Q10.

Solve the following equation for using LU Decomposition:

Choose your answer from the following:

2. None of these

Answer: B

