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Final Exam

1.a

If $a \approx b$, then the difficulty would be in trying to calculate for $a + b \approx 2a = 1 = 0$, which is impossible to solve for.

1.b

A numerically stable formula for calculating this would be /..... use yi+1 = yi +

2.a

.....

2.b

.....

3.a.i

For these values, a value overflow will occur, as we are taking a very large number then adding that same number squared. A way to overcome this problem is through scaling-down the values. A way to do this is to divide all the values by .....

3.a.ii

.....

3.b

.....

4

.....¡bisecction method?¿

5

.....

6.a

.....

6.b

.....

7.a

For the Jacobi iteration method to converge, or any iteration method for that matter, $\rho(B) < 1$. As spectral radius is the maximum of the set of eigenvalues, $\rho(B) = max|1 - \alpha\lambda|$.

7.b

8.a 8.b

9.a 9.b 9.c