

Gauss Jacobi / Jacobian Method:**Example:** (Given Equations)

$$3x + 20y - z = -18$$

$$2x - 3y + 20z = 25$$

$$20x + y - 2z = 17$$

Assumptions:

The system of equations has a unique solution

There is no zero entry among the diagonal or pivot elements of the coefficient matrix A.

Diagonally Dominant Form:

$$20x + y - 2z = 17$$

$$3x + 20y - z = -18$$

$$2x - 3y + 20z = 25$$

$$f1 = x = (17 - y + 2z)/20$$

$$f2 = y = (-18 - 3x + z)/20$$

$$f3 = z = (25 - 2x + 3y)/20$$

Let us assume $x=0$, $y=0$, $z=0$, and try to compute the value of x , y & z .

	Initial Assumption	Iteration=1	Iteration=2	Iteration=3	Iteration=4
x	0.000	0.850	1.020	1.001	1.000
y	0.000	-0.900	-0.965	-1.002	-1.000
z	0.000	1.250	1.030	1.003	1.000

If we assume, $x=10$, $y=10$, $z=10$

	Initial Assumption	Iteration=1	Iteration=2	Iteration=3	Iteration=4	Iteration=5
x	10.000	1.350	1.120	0.984	1.000	1.000
y	10.000	-1.900	-1.015	-1.027	-0.998	-1.000
z	10.000	1.750	0.830	0.986	0.998	1.000