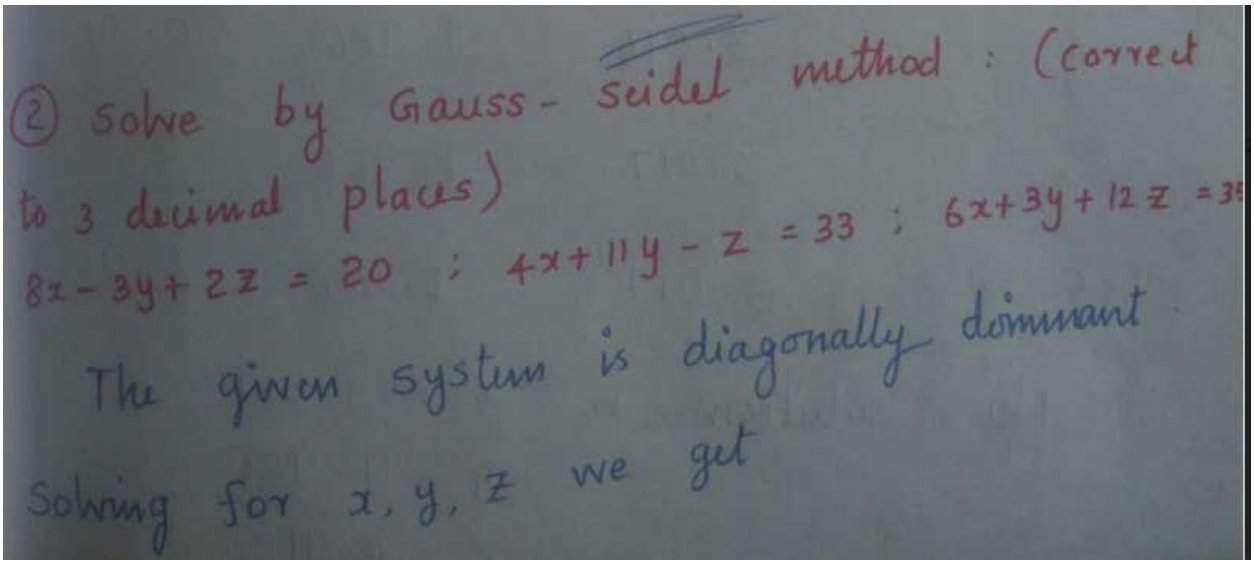
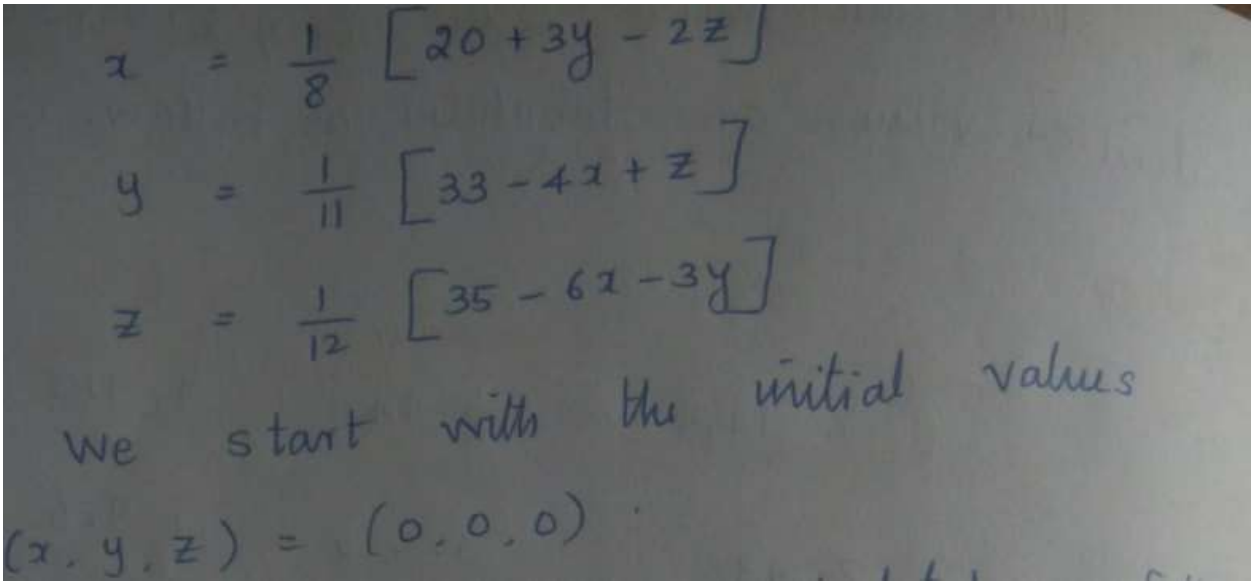
Topic: 3.7 – Gauss Seidal Iterative method

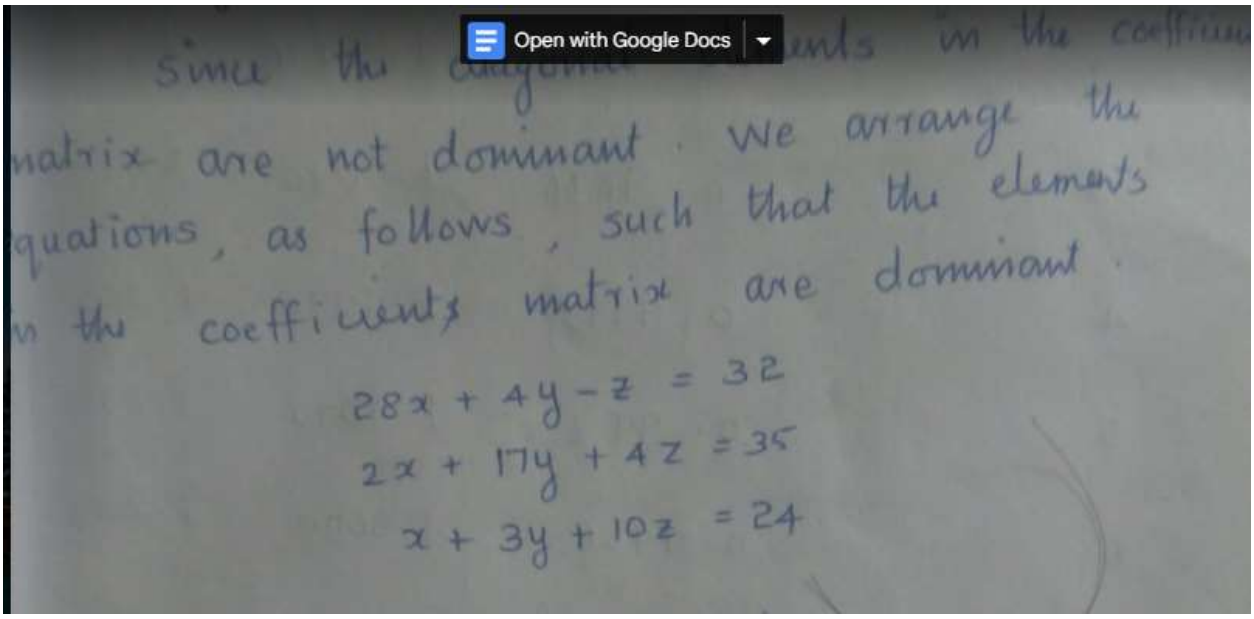




Iteration	x	y	z
1	2.5	2.091	1.144
2	2.998	2.014	0.914
3	3.027	1.982	0.908
4	3.016	1.986	0.912
5	3.017	1.986	0.912
6	3.017	1.986	0.912

$\therefore$ The solution is $x = 3.017$
$y = 1.986$
$z = 0.912$

③ Solve by Gauss-Seidel method:
$28x + 4y - z = 32$; $x + 3y + 10z = 24$;
$2x + 17y + 4z = 35$.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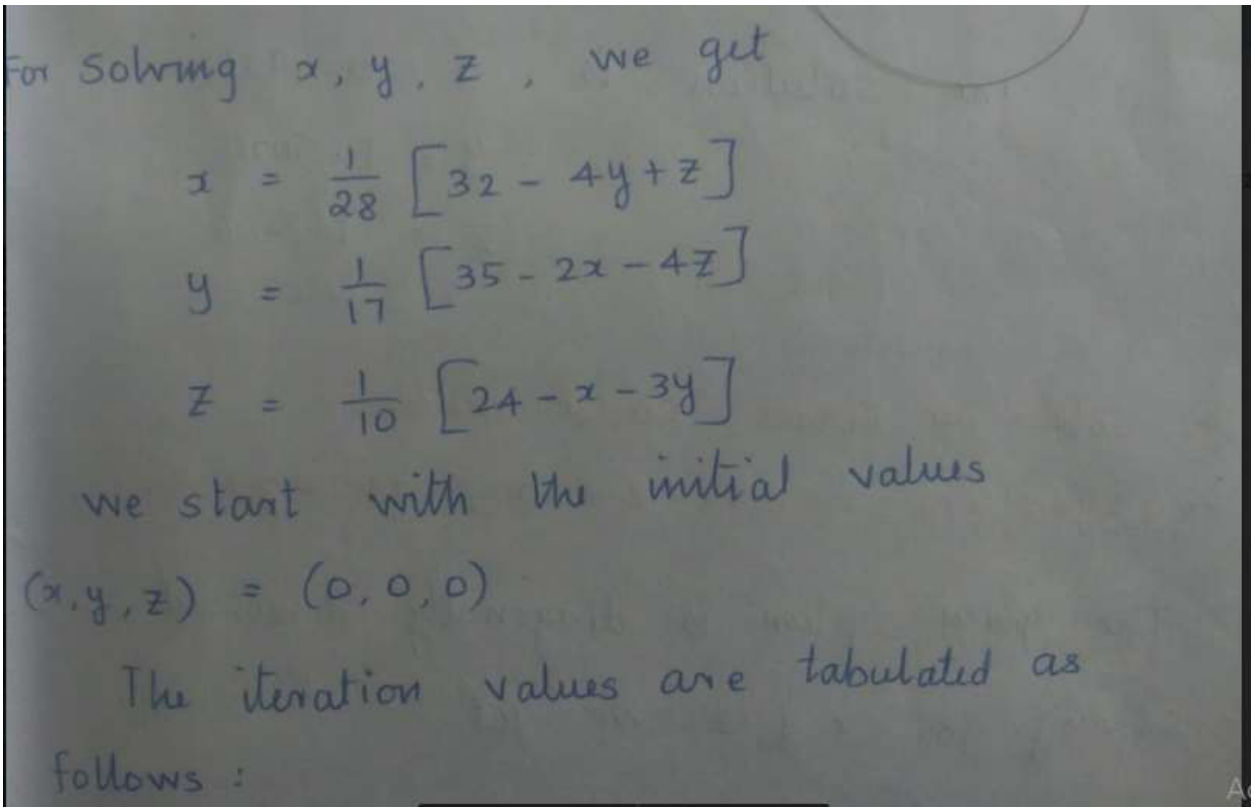
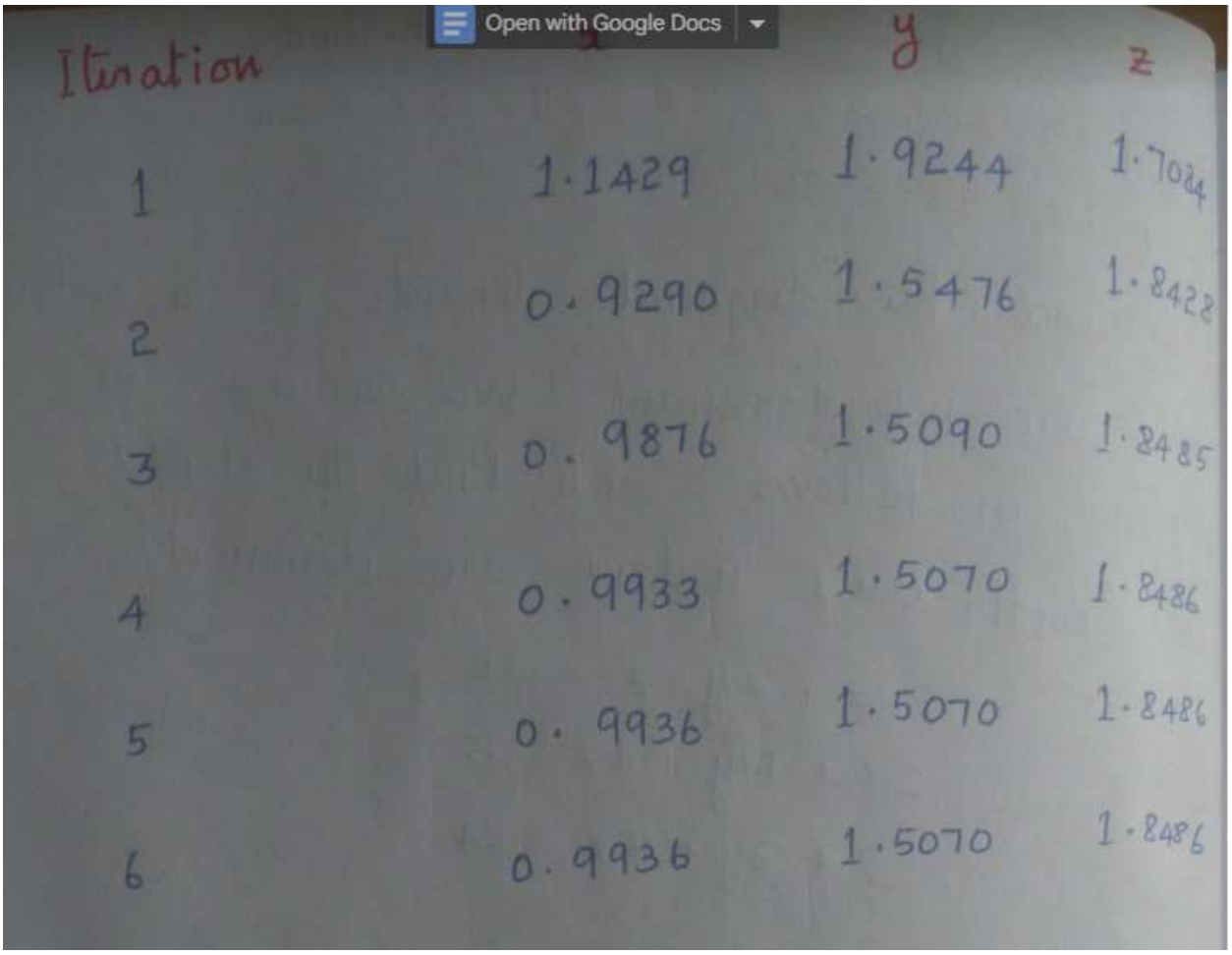
Since the
matrix are not dominant. We arrange the
equations, as follows, such that the elements
in the coefficients matrix are dominant.
28x + 4y - z = 32
2x + 17y + 4z = 35
x + 3y + 10z = 24


For solving x, y, z, we get
x = 1/28 [32 - 4y + z]
y = 1/17 [35 - 2x - 4z]
z = 1/10 [24 - x - 3y]
we start with the initial values
(x, y, z) = (0, 0, 0)
The iteration values are tabulated as
follows :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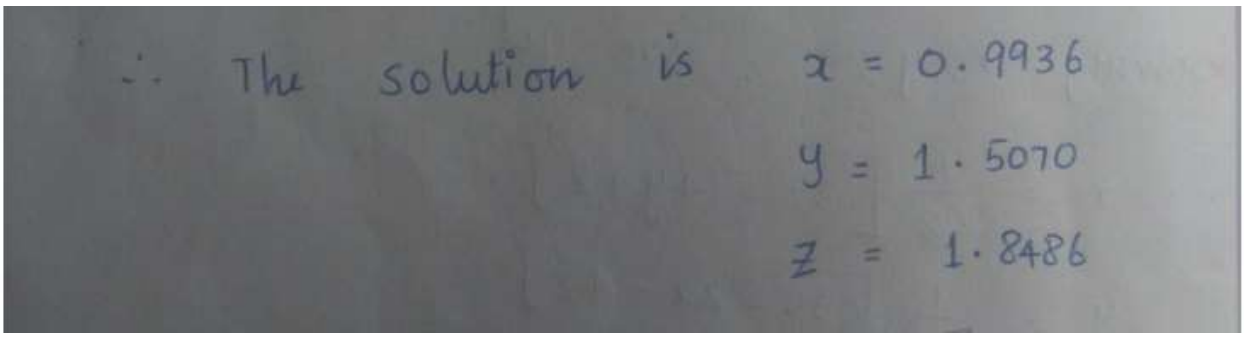
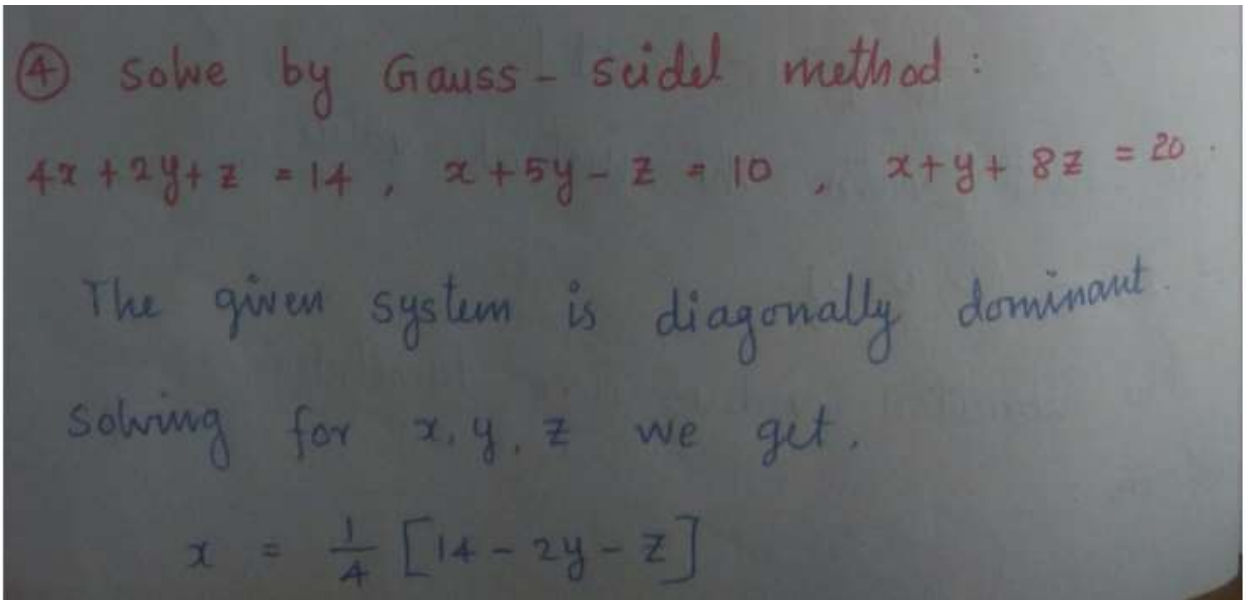
Iteration
y
z
1
1.1429
1.9244
1.7034
2
0.9290
1.5476
1.8428
3
0.9876
1.5090
1.8485
4
0.9933
1.5070
1.8486
5
0.9936
1.5070
1.8486
6
0.9936
1.5070
1.8486


∴ The solution is
x = 0.9936
y = 1.5070
z = 1.8486


④ Solve by Gauss - seidel method :
4x + 2y + z = 14 , x + 5y - z = 10 , x + y + 8z = 20
The given system is diagonally dominant.
Solving for x, y, z we get.
x = 1/4 [14 - 2y - z]