# Table of Contents

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```

# Manual iterations

```
i1 = 0; i2 = 0; i3 = 0;
% First Iteration
i1 = (10+5*i3)/9
i2 = (-2+12*i3)/20
i3 = (5*i1+12*i2)/20
% Begin Second Iteration
iold = [i1;i2;13];
i1 = (10+5*i3)/9
i2 = (-2+12*i3)/20
i3 = (5*i1+12*i2)/20
error_approx = abs((i1-iold(1))/i1)*100
% Begin Third Iteration
iold = [i1;i2;13];
i1 = (10+5*i3)/9
i2 = (-2+12*i3)/20
i3 = (5*i1+12*i2)/20
error_approx = abs((i1-iold(1))/i1)*100
error_approx = abs((i2-iold(2))/i2)*100
% Begin Fourth Iteration
iold = [i1;i2;13];
i1 = (10+5*i3)/9
i2 = (-2+12*i3)/20
i3 = (5*i1+12*i2)/20
error_approx = abs((i1-iold(1))/i1)*100
error_approx = abs((i2-iold(2))/i2)*100
% Begin Fifth Iteration
iold = [i1;i2;13];
i1 = (10+5*i3)/9
i2 = (-2+12*i3)/20
i3 = (5*i1+12*i2)/20
error_approx = abs((i1-iold(1))/i1)*100
error_approx = abs((i2-iold(2))/i2)*100
% Begin Sixth Iteration
iold = [i1;i2;13];
i1 = (10+5*i3)/9
i2 = (-2+12*i3)/20
i3 = (5*i1+12*i2)/20
error_approx = abs((i1-iold(1))/i1)*100
error_approx = abs((i2-iold(2))/i2)*100
```

```
% Begin Seventh Iteration
iold = [i1;i2;13];
i1 = (10+5*i3)/9
i2 = (-2+12*i3)/20
i3 = (5*i1+12*i2)/20
error_approx = abs((i1-iold(1))/i1)*100
error_approx = abs((i2-iold(2))/i2)*100
error_approx = abs((i3- iold(3))/i3)*100
iexact = [9 0 -5; 0 20 -12; -5 -12  20]\[10;-2;0]
iapprox = [i1;i2;i3]
```

*i1 =*
*    1.1111*
*i2 =*
*    -0.1000*
*i3 =*
*    0.2178*
*i1 =*
*    1.2321*
*i2 =*
*    0.0307*
*i3 =*
*    0.3264*
*error_approx =*
*    9.8196*
*i1 =*
*    1.2925*
*i2 =*
*    0.0959*
*i3 =*
*    0.3806*
*error_approx =*
*    4.6701*
*error_approx =*
*  68.0072*
*i1 =*
*    1.3226*
*i2 =*
*    0.1284*
*i3 =*
*    0.4077*
*error_approx =*
*    2.2768*
*error_approx =*
*  25.3330*
*i1 =*
*    1.3376*
*i2 =*
*    0.1446*
*i3 =*
*    0.4212*
*error_approx =*
*    1.1231*
*error_approx =*

```
    11.2203
i1 =
    1.3451
i2 =
    0.1527
i3 =
    0.4279
error_approx =
    0.5572
error_approx =
    5.3010
i1 =
    1.3488
i2 =
    0.1567
i3 =
    0.4312
error_approx =
    0.2772
error_approx =
    2.5765
error_approx =
    2.9145e+03
iexact =
    1.3525
    0.1608
    0.4346
iapprox =
    1.3488
    0.1567
    0.4312
```

# Using GaussSeidel Function

```
A=[9 0 -5; 0 20 -12; -5 -12 20]; b=[10 -2 0];
ifun = GaussSeidel(A,b,[],7)
ifun2 = GaussSeidel(A,b)

ifun =
    1.3488
    0.1567
    0.4312
ifun2 =
    1.3525
    0.1608
    0.4346
```

# Nonlinear

```
[x,f,ea,iter] = newtmult(@ws17,[3;3])

x =
    -0.1605
```

```
    0.4931
f =
   1.0e-10 *
    0.2581
   -0.0329
ea =
   1.0974e-08
iter =
     5
```

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