```
x_9
     3.0
         -3.000000x_1 + 3.000000x_2
                                          +2.000000x_4
                                                                           +3.000000x_7 +1.000000x_8
x_{10}
         +2.000000x_1 -2.000000x_2 -2.000000x_3 +3.000000x_4 \\
     4.0
                                                                +1.000000x_6 +2.000000x_7
x_{11}
x_{12}
    13.0
         -3.000000x_1 - 1.000000x_2 - 2.000000x_3
                                                                -2.000000x_6 + 2.000000x_7 - 2.000000x_8
     7.0
                    +1.000000x_2-2.000000x_3-3.000000x_4-3.000000x_5+2.0000000x_6\\
                                                                                      -2.000000x_8
x_{13}
     7.0
          -1.000000x_1
                                          -3.000000x_4 - 2.000000x_5 + 1.000000x_6 - 1.000000x_7 + 2.000000x_8
x_{14}
     3.0
         x_{15}
x_{16}
     9.0
                               +2.000000x_3 +3.000000x_4
                                                                           +3.000000x_7 -3.000000x_8
         -2.000000x_1 -2.000000x_2 +3.000000x_3 +3.000000x_4
                                                                +3.000000x_6 +1.000000x_7 +2.000000x_8
     3.0
x_{17}
    14.0
         -3.000000x_1 - 2.000000x_2
                                                     +1.000000x_5 +3.000000x_6
                                                                                      -1.000000x_8
x_{18}
                                                                           +2.000000x_7 -1.000000x_8
     9.0
         +1.000000x_1 -3.000000x_2 -3.000000x_3 +2.000000x_4 -1.000000x_5
x_{19}
                                          -2.000000x_4 -1.000000x_5 +3.000000x_6 +2.000000x_7 +1.000000x_8
     4.0
         +2.000000x_1 -3.000000x_2
x_{20}
         15.0
x_{21}
    5.0
         -1.000000x_1
                               +2.000000x_3 +3.000000x_4 -1.000000x_5 -2.000000x_6 -1.000000x_7 +1.000000x_8
x_{22}
    10.0
                               -3.000000x_3 -3.000000x_4 -1.000000x_5 -3.000000x_6 -1.000000x_7 -3.000000x_8
x_{23}
    0.0
         -1.000000x_1
                                          +2.000000x_4 -2.000000x_5 +2.000000x_6 +1.000000x_7 -1.000000x_8
```

No initialization required –; Proceed to Optimize.

```
3.0
x_9
x_{10}
                                                                           +3.000000x_7 +1.000000x_8
     3.0
         -3.000000x_1 + 3.000000x_2
                                          +2.000000x_4
     4.0
         +2.000000x_1 -2.000000x_2 -2.000000x_3 +3.000000x_4
                                                                +1.000000x_6 +2.000000x_7
x_{11}
    13.0
         -3.000000x_1 -1.000000x_2 -2.000000x_3
                                                                -2.000000x_6 +2.000000x_7 -2.000000x_8
x_{12}
                    +1.000000x_2-2.000000x_3-3.000000x_4-3.000000x_5+2.000000x_6\\
     7.0
                                                                                      -2.000000x_8
x_{13}
     7.0
         -1.000000x_1
                                          -3.000000x_4 - 2.000000x_5 + 1.000000x_6 - 1.000000x_7 + 2.000000x_8
x_{14}
     3.0
         x_{15}
x_{16}
     9.0
         +3.000000x_1
                               +2.000000x_3 +3.000000x_4
                                                                           +3.000000x_7 -3.000000x_8
     3.0
         -2.000000x_1 - 2.000000x_2 + 3.000000x_3 + 3.000000x_4
                                                                +3.000000x_6 +1.000000x_7 +2.000000x_8
x_{17}
    14.0
         -3.000000x_1 - 2.000000x_2
                                                     +1.000000x_5 +3.000000x_6
                                                                                      -1.000000x_8
x_{18}
         +1.000000x_1 -3.000000x_2 -3.000000x_3 +2.000000x_4 -1.000000x_5
     9.0
                                                                           +2.000000x_7 -1.000000x_8
x_{19}
     4.0
         +2.000000x_1 -3.000000x_2
                                          -2.000000x_4 - 1.000000x_5 + 3.000000x_6 + 2.000000x_7 + 1.000000x_8
x_{20}
    15.0
         x_{21}
     5.0
         -1.000000x_1
                               +2.000000x_3 +3.000000x_4 -1.000000x_5 -2.000000x_6 -1.000000x_7 +1.000000x_8
x_{22}
    10.0
                               -3.000000x_3 - 3.000000x_4 - 1.000000x_5 - 3.000000x_6 - 1.000000x_7 - 3.000000x_8
x_{23}
    0.0
                                          +2.000000x_4 -2.000000x_5 +2.000000x_6 +1.000000x_7 -1.000000x_8
         -1.000000x_1
```

 x_4 enters and x_{15} leaves

```
x_9
           6.0
                                               5.0
x_{10}
           7.0
                      x_{11}
          13.0
                      -3.000000x_1 - 1.000000x_2 - 2.000000x_3
                                                                                                                                                    -2.000000x_6 + 2.000000x_7 - 2.000000x_8
x_{12}
                                                                                                 +1.000000x_{15} -6.000000x_5 +4.000000x_6 +1.000000x_7 -3.000000x_8
           4.0
                      +3.000000x_1 +3.000000x_2
x_{13}
           4.0
                      +2.000000x_1 +2.000000x_2 +2.000000x_3 +1.000000x_{15} -5.000000x_5 +3.000000x_6
x_{14}
                                                                                                                                                                                                      +1.000000x_8
                      1.0
x_4
x_{16}
          12.0
                                                                                                 -1.000000x_{15} + 3.000000x_5 - 2.000000x_6 + 2.000000x_7 - 2.0000000x_8
           6.0
                      -5.000000x_1 - 4.000000x_2 + 1.000000x_3 - 1.000000x_{15} + 3.000000x_5 + 1.000000x_6
                                                                                                                                                                                                      +3.000000x_8
x_{17}
x_{18}
          14.0
                      -3.000000x_1 - 2.000000x_2
                                                                                                                           +1.000000x_5 +3.000000x_6
                                                                                                                                                                                                      -1.0000000x_8
                      x_{19}
          11.0
                      2.0
x_{20}
                      +1.000000x_1 + 0.333333x_2 + 2.333333x_3 + 0.666667x_{15} - 4.000000x_5 + 3.333333x_6 + 3.666667x_7 - 3.666667x_8 + 3.333333x_6 + 3.666667x_7 - 3.666667x_8 + 3.333333x_6 + 3.666667x_8 + 3.33333x_6 + 3.666667x_8 + 3.3333x_6 + 3.666667x_8 + 3.333x_8 + 3.666667x_8 + 3.666667x_8 + 3.333x_8 + 3.666667x_8 + 3.333x_8 + 3.666667x_8 + 3.333x_8 + 3.666667x_8 + 3.333x_8 + 3.666667x_8 + 3.33x_8 + 3.666667x_8 + 3.666667x_8 + 3.33x_8 + 3.666667x_8 + 3.66667x_8 + 3.66667x_8 + 3.66667x_8 + 3.666667x_8 + 3.666667x_8 + 3.666667x_8 + 3.66667x_8 + 3
          13.0
x_{21}
           8.0
                      -4.000000x_1 - 2.000000x_2
                                                                                                 -1.000000x_{15} + 2.000000x_5 - 4.000000x_6 - 2.000000x_7 + 2.0000000x_8
x_{22}
           7.0
                      +3.000000x_1 + 2.000000x_2 - 1.000000x_3 + 1.000000x_{15} - 4.000000x_5 - 1.000000x_6
                                                                                                                                                                                                     -4.000000x_8
x_{23}
                      -3.000000x_1 - 1.333333x_2 - 1.333333x_3 - 0.666667x_{15}
           2.0
                                                                                                                                                   +0.666667x_6+0.333333x_7-0.333333x_8
```

 x_6 enters and x_4 leaves

```
+4.500000x_1 -2.000000x_2
                              +0.500000x_{15}+1.500000x_5+4.500000x_4-0.500000x_7+2.500000x_8
x_9
   1.5
   3.0
       -3.000000x_1 + 3.000000x_2
                                              +2.000000x_4 +3.000000x_7 +1.000000x_8
x_{10}
       x_{11}
   5.5
x_{12}
   10.0
               +1.000000x_2
                              +1.000000x_{15} -3.000000x_5 +3.000000x_4 +3.000000x_7 -3.000000x_8
   10.0
       -3.000000x_1 - 1.000000x_2 - 4.000000x_3 - 1.000000x_{15}
                                              -6.000000x_4 - 1.000000x_7 - 1.0000000x_8
x_{13}
   8.5
       x_{14}
       1.5
x_6
x_{16}
   9.0
                      +2.000000x_3
                                              +3.000000x_4 +3.000000x_7 -3.000000x_8
       +3.0000000x_1
x_{17}
   7.5
       -6.500000x_1 -5.000000x_2
                              -1.500000x_{15} + 4.500000x_5 - 1.500000x_4 - 0.500000x_7 + 3.500000x_8
x_{18}
   18.5
       9.0
       +1.000000x_1 -3.000000x_2 -3.000000x_3
                                       -1.000000x_5 + 2.000000x_4 + 2.000000x_7 - 1.000000x_8
x_{19}
   8.5
       x_{20}
       x_{21}
   18.0
x_{22}
   2.0
       +2.000000x_1 +2.000000x_2 +4.000000x_3 +1.000000x_{15} -4.000000x_5 +6.000000x_4
       +4.500000x_1 +3.000000x_2
                              +1.500000x_{15} -5.500000x_5 +1.500000x_4 +0.500000x_7 -4.500000x_8
x_{23}
   5.5
   3.0
       z
```

 x_5 enters and x_{22} leaves

```
x_9
   2.25
       3.0
       -3.000000x_1 + 3.000000x_2
                                            +2.000000x_4 +3.000000x_7 +1.000000x_8
x_{10}
   6.25
       +1.250000x_1 - 2.250000x_2 - 1.500000x_3 - 0.125000x_{15} - 0.375000x_{22} + 3.750000x_4 + 1.500000x_7 + 0.500000x_8
x_{11}
x_{12}
   8.5
       -1.500000x_1 - 0.500000x_2 - 3.000000x_3 + 0.250000x_{15} + 0.750000x_{22} - 1.500000x_4 + 3.000000x_7 - 3.000000x_8
       -3.000000x_1 - 1.000000x_2 - 4.000000x_3 - 1.000000x_{15}
   10.0
                                            -6.000000x_4 - 1.000000x_7 - 1.000000x_8
x_{13}
   8.25
       x_{14}
   2.25
       x_6
x_{16}
   9.0
                     +2.000000x_3
                                            +3.000000x_4 +3.000000x_7 -3.000000x_8
       9.75
x_{17}
x_{18}
   21.25
       8.5
x_{19}
   10.25
       x_{20}
                            -0.750000x_{15} - 0.250000x_{22} - 3.500000x_4 + 2.000000x_7 - 2.000000x_8
   18.5
       -3.500000x_1 - 2.500000x_2
x_{21}
   0.5
       +0.500000x_1 + 0.500000x_2 + 1.000000x_3 + 0.250000x_{15} - 0.250000x_{22} + 1.500000x_4
x_5
   2.75
       x_{23}
   3.5
       -3.500000x_1 - 1.500000x_2 - 1.000000x_3 - 0.750000x_{15} - 0.250000x_{22} + 0.500000x_4
z
```

 x_4 enters and x_{23} leaves

```
+7.000000x_1 - 1.000000x_2 - 4.000000x_3 + 1.000000x_{15} + 1.000000x_{22} - 1.000000x_{23}
                                                                                     5.0
  x_9
                                                                                                                                                                        -2.481481x_1 + 3.074074x_2 - 1.629630x_3 + 0.037037x_{15} + 0.407407x_{22} - 0.296296x_{23} + 3.148148x_7 - 0.37037x_{15} + 0.407407x_{22} - 0.296296x_{23} + 0.037037x_{15} +
x_{10}
                                             3.81481481481
 x_{11}
                                             7.7777777778
                                                                                                                                                                      +2.222222x_1 - 2.111111x_2 - 4.555556x_3 - 0.055556x_{15} + 0.38889x_{22} - 0.555556x_{23} + 1.777778x_7 - 2.06x_{15} + 0.06x_{15} + 
x_{12}
                                             7.8888888889
                                                                                                                                                                        -1.888889x_1 - 0.555556x_2 - 1.777778x_3 + 0.222222x_{15} + 0.444444x_{22} + 0.222222x_{23} + 2.888889x_7 - 2.6
                                                                                                                                                                        -4.555556x_1 - 1.222222x_2 + 0.888889x_3 - 1.111111x_{15} - 1.222222x_{22} + 0.88889x_{23} - 1.444444x_7 + 3.66x_{15} + 1.222222x_{15} + 0.88889x_{15} + 0.88889x_{15} + 0.88889x_{15} + 0.88889x_{15} + 0.88889x_{15} + 0.888889x_{15} + 0.88889x_{15} + 0.88889x_{15} + 0.888889x_{15} + 0.8888889x_{15} + 0.8888889x_{15} + 0.8888888x_{15} + 0.8888888x_{15} + 0.888888x_{15} + 0.888888x_{15} + 0.888888x_{15} + 0.888888x_{15} + 0.88888x_{15} + 0.88888x
                                             7.5555555556
 x_{13}
                                             6.111111111111
                                                                                                                                                                        -4.111111x_1 - 1.444444x_2 + 2.777778x_3 - 0.722222x_{15} - 0.944444x_{22} + 0.777778x_{23} - 1.888889x_7 + 6.00x_{10} + 0.00x_{10} +
x_{14}
                                                                                                                                                                      -0.555556x_1 - 0.222222x_2 - 0.1111111x_3 - 0.1111111x_{15} - 0.222222x_{22} - 0.1111111x_{23} - 0.444444x_7
                                             2.5555555556
  x_6
x_{16}
                                             10.22222222
                                                                                                                                                                      +3.777778x_1 + 0.1111111x_2 - 0.444444x_3 + 0.055556x_{15} + 0.611111x_{22} - 0.444444x_{23} + 3.222222x_7 - 5.0
                                              11.888888889
                                                                                                                                                                        -2.888889x_1 - 2.555556x_2 + 0.222222x_3 - 0.277778x_{15} - 0.055556x_{22} - 0.777778x_{23} - 0.111111x_7
 x_{17}
                                              22.777777778
                                                                                                                                                                        -3.777778x_1 - 2.1111111x_2 - 0.555556x_3 - 0.055556x_{15} - 0.611111x_{22} - 0.555556x_{23} - 1.222222x_7 - 2.06x_{15} - 0.06x_{15} 
x_{18}
                                                                                                                                                                        8.7037037037
 x_{19}
                                            9.74074074074
                                                                                                                                                                         x_{20}
                                                                                                                                                                         -4.407407x_1 - 2.629630x_2 + 2.851852x_3 - 0.814815x_{15} - 0.962963x_{22} + 0.518519x_{23} + 1.740741x_7 + 0.518519x_{23} + 0.518517x_{23} + 0.5187x_{23} + 0.518x_{23} + 0.518x_{23} + 0.518x_{23} + 0.518x_{23} + 0.518x_{23} + 0.518x_{23} + 0.
 x_{21}
                                             17.0740740741
                                            1.111111111111
                                                                                                                                                                      x_5
                                        0.407407407407
                                                                                                                                                                      x_4
                                                 3.7037037037
                                                                                                                                                                         z
```

 x_7 enters and x_{14} leaves

```
5.0
                                 +7.000000x_1 - 1.000000x_2 - 4.000000x_3 + 1.000000x_{15} + 1.000000x_{22} - 1.000000x_{23}
x_9
                                  14.0
x_{10}
         13.5294117647
                                  x_{11}
        17.2352941176
                                 x_{12}
        2.88235294118
                                 x_{13}
        3.23529411765
                                  x_7
                                 1.11764705882
x_6
x_{16}
        20.6470588235
                                  -2.647059x_1 - 2.470588x_2 + 0.058824x_3 - 0.235294x_{15}
                                                                                                                                    -0.823529x_{23} + 0.058824x_{14} - 0.058824x_{14}
         11.5294117647
x_{17}
x_{18}
         18.8235294118
                                  -1.117647x_1 -1.176471x_2 -2.352941x_3 +0.411765x_{15}
                                                                                                                                    -1.058824x_{23} + 0.647059x_{14} - 5.
                                 -3.803922x_1 - 5.039216x_2 - 1.411765x_3 - 1.019608x_{15} - 0.666667x_{22} + 0.764706x_{23} - 1.078431x_{14} + 5.066667x_{15} - 0.0666667x_{15} + 0.0666667x_{15} - 0.0666667x_{15} + 0.0666667x_{15} - 0.0666667x_{15} + 0.0666667x_{15} - 0.0666667x_{15} + 0.066667x_{15} 
         15.2941176471
x_{19}
                                  11.0588235294
x_{20}
                                  22.7058823529
x_{21}
                                 1.47058823529
x_5
        0.647058823529
                                 x_4
                                  3.82352941176
```

 x_{-1} enters and Final Dictionary Solution: 3.82352941176 Num Pivots: 5