```
x_9
     12.0
          x_{10}
     4.0
          -2.000000x_1 - 2.000000x_2 + 1.000000x_3 + 3.000000x_4 - 3.000000x_5
                                                                              -3.000000x_7
x_{11}
     8.0
          -2.000000x_1
                                 -3.000000x_3 + 3.000000x_4 + 3.000000x_5 + 2.000000x_6 + 3.000000x_7 + 3.000000x_8
x_{12}
     9.0
          -2.000000x_1
                                 -1.000000x_3 - 2.000000x_4 + 1.000000x_5 - 1.000000x_6 - 1.000000x_7 - 2.000000x_8
x_{13}
    11.0
                      -1.000000x_2
                                                                   -1.000000x_6 + 1.000000x_7 + 1.000000x_8
x_{14}
                     +1.000000x_2 -3.000000x_3 +1.000000x_4 -2.000000x_5
     4.0
                                                                                         +3.000000x_8
x_{15}
          -3.000000x_1 + 1.000000x_2 + 1.000000x_3 - 1.000000x_4 - 1.000000x_5
x_{16}
     15.0
                                                                                         -2.000000x_8
     10.0
          +2.000000x_1 +1.000000x_2 -1.000000x_3 +2.000000x_4
                                                                   -1.000000x_6 + 1.000000x_7 - 1.000000x_8
x_{17}
x_{18}
     2.0
          +3.000000x_1 + 2.000000x_2 + 3.000000x_3 + 1.000000x_4 + 1.000000x_5 - 2.000000x_6 - 1.000000x_7 + 2.000000x_8
     3.0
          +1.000000x_1 -2.000000x_2 +3.000000x_3 +2.000000x_4
                                                                   +3.000000x_6 +2.000000x_7 +2.000000x_8
x_{19}
     5.0
          +1.000000x_1 -3.000000x_2 +2.0000000x_3 +3.0000000x_4 +1.0000000x_5
                                                                              +1.000000x_7 -2.000000x_8
x_{20}
     9.0
                                 -1.000000x_3 + 2.000000x_4 - 1.0000000x_5 - 1.0000000x_6 + 3.0000000x_7
          -2.000000x_1
x_{21}
    13.0
          +2.000000x_1 +1.000000x_2
                                            +2.000000x_4 -2.000000x_5 +2.000000x_6
                                                                                         +3.000000x_8
x_{22}
    13.0
          x_{23}
          -1.000000x_1 - 2.000000x_2 - 2.000000x_3 - 1.000000x_4 + 2.000000x_5 + 1.000000x_6
     0.0
                                                                                         -2.000000x_8
```

No initialization required –; Proceed to Optimize.

```
8.0
          -3.000000x_1 + 2.000000x_2 + 3.000000x_3 + 1.000000x_4 - 3.000000x_5 - 1.000000x_6 - 1.000000x_7
x_9
x_{10}
    12.0
          4.0
          -2.000000x_1 -2.000000x_2 +1.000000x_3 +3.000000x_4 -3.000000x_5 \\
                                                                             -3.000000x_7
x_{11}
     8.0
                                -3.000000x_3 + 3.000000x_4 + 3.000000x_5 + 2.000000x_6 + 3.000000x_7 + 3.000000x_8
x_{12}
          -2.000000x_1
     9.0
          -2.000000x_1
                                -1.000000x_3 - 2.000000x_4 + 1.000000x_5 - 1.000000x_6 - 1.000000x_7 - 2.000000x_8
x_{13}
    11.0
                     -1.000000x_2
                                                                  -1.000000x_6 + 1.000000x_7 + 1.000000x_8
x_{14}
     4.0
                     +1.000000x_2 -3.000000x_3 +1.000000x_4 -2.000000x_5
                                                                                        +3.000000x_8
x_{15}
x_{16}
    15.0
          -3.000000x_1 + 1.000000x_2 + 1.000000x_3 - 1.000000x_4 - 1.000000x_5
                                                                                         -2.000000x_8
          +2.000000x_1 +1.000000x_2 -1.000000x_3 +2.000000x_4
                                                                  -1.000000x_6 + 1.000000x_7 - 1.000000x_8
    10.0
     2.0
          x_{18}
          +1.000000x_1 -2.000000x_2 +3.000000x_3 +2.000000x_4
     3.0
                                                                  +3.000000x_6 +2.000000x_7 +2.000000x_8
x_{19}
     5.0
          +1.000000x_1 -3.000000x_2 +2.000000x_3 +3.000000x_4 +1.000000x_5
                                                                             +1.000000x_7 -2.000000x_8
x_{20}
     9.0
          -2.000000x_1
                                -1.000000x_3 + 2.000000x_4 - 1.000000x_5 - 1.000000x_6 + 3.000000x_7
x_{21}
                                           +2.000000x_4 -2.000000x_5 +2.000000x_6
    13.0
         +2.000000x_1 +1.000000x_2
                                                                                        +3.000000x_8
x_{22}
    13.0
          x_{23}
          \overline{-1.000000x_1 - 2.000000x_2 - 2.000000x_3 - 1.000000}x_4 + 2.0000000x_5 + 1.0000000x_6
     0.0
                                                                                         -2.000000x_8
```

 x_5 enters and x_{11} leaves

```
4.0
               x_9
       8.0
               x_{10}
   1.33333333333
               -0.666667x_1 - 0.666667x_2 + 0.333333x_3 + 1.000000x_4 - 0.333333x_{11}
                                                                     -1.000000x_7
x_5
x_{12}
       12.0
               -4.000000x_1 - 2.000000x_2 - 2.000000x_3 + 6.000000x_4 - 1.000000x_{11} + 2.000000x_6
                                                                              +3.000
   10.3333333333
              x_{13}
                                                            -1.000000x_6 + 1.000000x_7 + 1.000
       11.0
x_{14}
               +1.333333x_1 + 2.333333x_2 - 3.666667x_3 - 1.000000x_4 + 0.666667x_{11}
   1.33333333333
                                                                     +2.000000x_7 +3.000
x_{15}
               -2.333333x_1 + 1.666667x_2 + 0.666667x_3 - 2.000000x_4 + 0.333333x_{11}
x_{16}
   13.666666667
                                                                     +1.000000x_7 - 2.000
               +2.000000x_1 +1.000000x_2 -1.000000x_3 +2.000000x_4
                                                            -1.000000x_6 + 1.000000x_7 - 1.000
       10.0
x_{17}
   3.33333333333
               x_{18}
                                                            +3.000000x_6 +2.000000x_7 +2.000
       3.0
               +1.000000x_1 -2.000000x_2 +3.000000x_3 +2.000000x_4
x_{19}
   6.33333333333
               +0.333333x_1 -3.666667x_2 +2.3333333x_3 +4.000000x_4 -0.3333333x_{11}
x_{20}
               x_{21}
   7.66666666667
   10.3333333333
              +3.333333x_1 + 2.333333x_2 - 0.666667x_3
                                                  +0.666667x_{11} +2.000000x_6 +2.000000x_7 +3.000
x_{22}
               +3.000000x_1 +1.000000x_2
                                                  +1.000000x_{11} +1.000000x_6 +2.000000x_7 -1.000
       9.0
x_{23}
              2.6666666667
```

 x_4 enters and x_{15} leaves

```
-3.666667x_1 -0.666667x_2 +9.333333x_3 +2.000000x_{15} -0.333333x_{11} -1.000000x_6 -2.000000x_7 -0.000000x_7
    1.33333333333
x_9
x_{10}
    2.66666666667
                x_5
    2.66666666667
                +0.666667x_1 +1.666667x_2 -3.333333x_3 -1.000000x_{15} +0.333333x_{11}
                                                                             +1.000000x_7 +3
x_{12}
       20.0
                9.0
                -4.000000x_1 -3.000000x_2 +3.000000x_3 +1.000000x_{15} -1.000000x_{11} -1.000000x_6 -4.000000x_7
x_{13}
                           -1.000000x_2
                                                                   -1.000000x_6 +1.000000x_7
       11.0
x_{14}
                +1.333333x_1 + 2.333333x_2 -3.666667x_3 -1.000000x_{15} +0.666667x_{11}
    1.33333333333
                                                                             +2.000000x_7 +3
x_4
                -5.000000x_1 -3.000000x_2 +8.000000x_3 +2.000000x_{15} -1.000000x_{11}
x_{16}
                                                                             -3.000000x_7
       11.0
    12.6666666667
                x_{17}
        6.0
                x_{18}
                5.6666666667
x_{19}
    11.6666666667
                +5.666667x_1 +5.666667x_2 -12.333333x_3 -4.000000x_{15} +2.333333x_{11}
                                                                             +8.000000x_7 +1
x_{20}
                -0.0000000x_1 +3.0000000x_2 -5.0000000x_3 -1.0000000x_{15} +1.0000000x_{11} -1.000000x_6 +6.0000000x_7
x_{21}
        9.0
    10.3333333333
                +3.333333x_1 + 2.333333x_2 -0.666667x_3
                                                        +0.666667x_{11} +2.000000x_6 +2.000000x_7
x_{22}
                                                        +1.000000x_{11} +1.000000x_6 +2.000000x_7
x_{23}
        9.0
                +3.000000x_1 +1.000000x_2
        4.0
                -1.000000x_1 -1.000000x_2 -5.000000x_3 -1.000000x_{15}
                                                                   +1.000000x_6
 z
```

 x_6 enters and x_9 leaves

```
1.33333333333
x_6
               +3.333333x_1 -7.666667x_2 +3.333333x_3 +2.000000x_{15} -1.333333x_{11} +1.000000x_9 -1.000000x_7 -9.000000x_7
   1.33333333333
x_{10}
               +0.666667x_1 +1.666667x_2 -3.333333x_3 -1.000000x_{15} +0.333333x_{11}
   2.66666666667
                                                                      +1.000000x_7 +3
x_5
x_{12}
   22.6666666667
               -0.333333x_1 -2.333333x_2 -6.333333x_3 -1.000000x_{15} -0.666667x_{11} +1.000000x_9 -2.000000x_7 +1.0000000x_9
   7.66666666667
x_{13}
   9.6666666667
               +3.666667x_1 -0.3333333x_2 -9.3333333x_3 -2.000000x_{15} +0.333333x_{11} +1.000000x_9 +3.000000x_7 +7.0000000x_1
x_{14}
   1.33333333333
               +1.333333x_1 +2.333333x_2 -3.666667x_3 -1.000000x_{15} +0.666667x_{11}
                                                                      +2.000000x_7 +3
x_4
x_{16}
               -5.000000x_1 -3.000000x_2 +8.000000x_3 +2.000000x_{15} -1.000000x_{11}
                                                                       -3.000000x_7 -8
       11.0
               x_{17}
   11.3333333333
              3.33333333333
x_{18}
               9.66666666667
x_{19}
   11.6666666667
               +5.666667x_1 +5.666667x_2 -12.3333333x_3 -4.000000x_{15} +2.3333333x_{11}
                                                                       +8.000000x_7 +1
x_{20}
               7.66666666667
x_{21}
       13.0
               x_{22}
   10.3333333333
               -0.666667x_1 + 0.333333x_2 + 9.333333x_3 + 2.000000x_{15} + 0.666667x_{11} - 1.000000x_9
x_{23}
               -4.666667x_1 -1.666667x_2 +4.333333x_3 +1.000000x_{15} -0.333333x_{11} -1.000000x_9 -2.000000x_7 -3.0000000x_9
   5.33333333333
```

 x_3 enters and x_{18} leaves

```
2.70588235294
                        +1.411765x_1 + 2.352941x_2 - 0.411765x_{18} - 0.470588x_{15} + 0.352941x_{11} - 0.176471x_9 + 0.470588x_7 + 2.
x_6
x_{10}
      1.82352941176
                        +5.147059x_1 - 6.588235x_2 - 0.147059x_{18} + 1.117647x_{15} - 1.088235x_{11} + 1.294118x_9 - 0.117647x_7 - 6.
                        -1.147059x_1 + 0.588235x_2 + 0.147059x_{18} - 0.117647x_{15} + 0.088235x_{11} - 0.294118x_9 + 0.117647x_7 + 0.
x_5
      2.17647058824
x_{12}
      21.8823529412
                        -6.235294x_1 + 8.941176x_2 + 0.235294x_{18} - 0.588235x_{15} + 1.941176x_{11} - 2.470588x_9 + 6.588235x_7 + 4.
      6.73529411765
                        -3.779412x_1 - 4.382353x_2 + 0.279412x_{18} + 0.676471x_{15} - 1.132353x_{11} + 0.441176x_9 - 3.676471x_7 - 4.
x_{13}
      8.29411764706
                        -1.411765x_1 -3.352941x_2 +0.411765x_{18} +0.470588x_{15} -0.352941x_{11} +0.176471x_9 +0.529412x_7 -1.
x_{14}
                        -0.661765x_1 + 1.147059x_2 + 0.161765x_{18} - 0.029412x_{15} + 0.397059x_{11} - 0.323529x_9 + 1.029412x_7 - 0.
x_4
     0.794117647059
                        -0.647059x_1 - 0.411765x_2 - 0.352941x_{18} - 0.117647x_{15} - 0.411765x_{11} + 0.705882x_9 - 0.882353x_7 - 0.
x_{16}
      12.1764705882
      8.73529411765
                        -1.279412x_1 + 0.617647x_2 + 0.779412x_{18} + 0.676471x_{15} + 0.367647x_{11} - 0.558824x_9 + 2.323529x_7 - 4.
x_{17}
     0.147058823529
                        +0.544118x_1 + 0.323529x_2 - 0.044118x_{18} - 0.264706x_{15} + 0.073529x_{11} + 0.088235x_9 + 0.264706x_7 + 0.
x_3
                        13.1470588235
x_{19}
      9.85294117647
                        -1.044118x_1 + 1.676471x_2 + 0.544118x_{18} - 0.735294x_{15} + 1.426471x_{11} - 1.088235x_9 + 4.735294x_7 - 0.
x_{20}
                        -4.132353x_1 - 0.970588x_2 + 0.632353x_{18} + 0.794118x_{15} + 0.279412x_{11} - 0.264706x_9 + 4.205882x_7 - 3.
x_{21}
      5.55882352941
      15.6470588235
                        +5.794118x_1 + 6.823529x_2 - 0.794118x_{18} - 0.764706x_{15} + 1.323529x_{11} - 0.411765x_9 + 2.764706x_7 + 6.
x_{22}
      11.7058823529
                        +4.411765x_1 +3.352941x_2 -0.411765x_{18} -0.470588x_{15} +1.352941x_{11} -0.176471x_9 +2.470588x_7 +1.
x_{23}
      5.97058823529
                        -2.308824x_{1} - 0.264706x_{2} - 0.191176x_{18} - 0.147059x_{15} - 0.014706x_{11} - 0.617647x_{9} - 0.852941x_{7} - 1.
 z
```

 x_{-1} enters and Final Dictionary Solution: 5.97058823529 Num Pivots: 4