| | | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ | $x_7$ |
|---|---|---|---|---|---|---|---|---|
| $x_8$ | 14.0 | $+2.000000x_1$ | $-1.000000x_2$ | $-3.000000x_3$ | $-1.000000x_4$ | $-1.000000x_5$ | $-3.000000x_6$ | |
| $x_9$ | 10.0 | $+3.000000x_1$ | | $-1.000000x_3$ | $-2.000000x_4$ | $+3.000000x_5$ | | $-1.000000x_7$ |
| $x_{10}$ | 5.0 | $-3.000000x_1$ | $+2.000000x_2$ | $-3.000000x_3$ | $-1.000000x_4$ | $+3.000000x_5$ | $+3.000000x_6$ | $+2.000000x_7$ |
| $x_{11}$ | 5.0 | $-3.000000x_1$ | | $+3.000000x_3$ | $-1.000000x_4$ | $-3.000000x_5$ | $+1.000000x_6$ | $-2.000000x_7$ |
| $x_{12}$ | 7.0 | $+2.000000x_1$ | $+1.000000x_2$ | $-2.000000x_3$ | $+3.000000x_4$ | $-2.000000x_5$ | $-1.000000x_6$ | |
| $x_{13}$ | 12.0 | $+1.000000x_1$ | | $+2.000000x_3$ | | $-2.000000x_5$ | | $+1.000000x_7$ |
| $x_{14}$ | 7.0 | $+3.000000x_1$ | $+3.000000x_2$ | | $+1.000000x_4$ | $+3.000000x_5$ | $+2.000000x_6$ | $+1.000000x_7$ |
| $x_{15}$ | 7.0 | $-2.000000x_1$ | $-3.000000x_2$ | $-1.000000x_3$ | $+2.000000x_4$ | $-3.000000x_5$ | $-1.000000x_6$ | $-2.000000x_7$ |
| $x_{16}$ | 6.0 | $+3.000000x_1$ | | | $-2.000000x_4$ | $-2.000000x_5$ | $+2.000000x_6$ | $+2.000000x_7$ |
| $x_{17}$ | 3.0 | $+3.000000x_1$ | $+2.000000x_2$ | $+1.000000x_3$ | $-3.000000x_4$ | $+3.000000x_5$ | | $+3.000000x_7$ |
| $z$ | 0.0 | $-2.000000x_1$ | $-1.000000x_2$ | $-2.000000x_3$ | $+2.000000x_4$ | $+1.000000x_5$ | $+1.000000x_6$ | |

No initialization required −¿ Proceed to Optimize.

| | | $x_1$ | $x_2$ | $x_3$ | $x_4$ | $x_5$ | $x_6$ | $x_7$ |
|---|---|---|---|---|---|---|---|---|
| $x_8$ | 14.0 | $+2.000000x_1$ | $-1.000000x_2$ | $-3.000000x_3$ | $-1.000000x_4$ | $-1.000000x_5$ | $-3.000000x_6$ | |
| $x_9$ | 10.0 | $+3.000000x_1$ | | $-1.000000x_3$ | $-2.000000x_4$ | $+3.000000x_5$ | | $-1.000000x_7$ |
| $x_{10}$ | 5.0 | $-3.000000x_1$ | $+2.000000x_2$ | $-3.000000x_3$ | $-1.000000x_4$ | $+3.000000x_5$ | $+3.000000x_6$ | $+2.000000x_7$ |
| $x_{11}$ | 5.0 | $-3.000000x_1$ | | $+3.000000x_3$ | $-1.000000x_4$ | $-3.000000x_5$ | $+1.000000x_6$ | $-2.000000x_7$ |
| $x_{12}$ | 7.0 | $+2.000000x_1$ | $+1.000000x_2$ | $-2.000000x_3$ | $+3.000000x_4$ | $-2.000000x_5$ | $-1.000000x_6$ | |
| $x_{13}$ | 12.0 | $+1.000000x_1$ | | $+2.000000x_3$ | | $-2.000000x_5$ | | $+1.000000x_7$ |
| $x_{14}$ | 7.0 | $+3.000000x_1$ | $+3.000000x_2$ | | $+1.000000x_4$ | $+3.000000x_5$ | $+2.000000x_6$ | $+1.000000x_7$ |
| $x_{15}$ | 7.0 | $-2.000000x_1$ | $-3.000000x_2$ | $-1.000000x_3$ | $+2.000000x_4$ | $-3.000000x_5$ | $-1.000000x_6$ | $-2.000000x_7$ |
| $x_{16}$ | 6.0 | $+3.000000x_1$ | | | $-2.000000x_4$ | $-2.000000x_5$ | $+2.000000x_6$ | $+2.000000x_7$ |
| $x_{17}$ | 3.0 | $+3.000000x_1$ | $+2.000000x_2$ | $+1.000000x_3$ | $-3.000000x_4$ | $+3.000000x_5$ | | $+3.000000x_7$ |
| $z$ | 0.0 | $-2.000000x_1$ | $-1.000000x_2$ | $-2.000000x_3$ | $+2.000000x_4$ | $+1.000000x_5$ | $+1.000000x_6$ | |

$x_4$ enters and $x_{17}$ leaves

| | | $x_1$ | $x_2$ | $x_3$ | $x_{17}$ | $x_5$ | $x_6$ | $x_7$ |
|---|---|---|---|---|---|---|---|---|
| $x_8$ | 13.0 | $+1.000000x_1$ | $-1.666667x_2$ | $-3.333333x_3$ | $+0.333333x_{17}$ | $-2.000000x_5$ | $-3.000000x_6$ | $-1.000000x_7$ |
| $x_9$ | 8.0 | $+1.000000x_1$ | $-1.333333x_2$ | $-1.666667x_3$ | $+0.666667x_{17}$ | $+1.000000x_5$ | | $-3.000000x_7$ |
| $x_{10}$ | 4.0 | $-4.000000x_1$ | $+1.333333x_2$ | $-3.333333x_3$ | $+0.333333x_{17}$ | $+2.000000x_5$ | $+3.000000x_6$ | $+1.000000x_7$ |
| $x_{11}$ | 4.0 | $-4.000000x_1$ | $-0.666667x_2$ | $+2.666667x_3$ | $+0.333333x_{17}$ | $-4.000000x_5$ | $+1.000000x_6$ | $-3.000000x_7$ |
| $x_{12}$ | 10.0 | $+5.000000x_1$ | $+3.000000x_2$ | $-1.000000x_3$ | $-1.000000x_{17}$ | $+1.000000x_5$ | $-1.000000x_6$ | $+3.000000x_7$ |
| $x_{13}$ | 12.0 | $+1.000000x_1$ | | $+2.000000x_3$ | | $-2.000000x_5$ | | $+1.000000x_7$ |
| $x_{14}$ | 8.0 | $+4.000000x_1$ | $+3.666667x_2$ | $+0.333333x_3$ | $-0.333333x_{17}$ | $+4.000000x_5$ | $+2.000000x_6$ | $+2.000000x_7$ |
| $x_{15}$ | 9.0 | | $-1.666667x_2$ | $-0.333333x_3$ | $-0.666667x_{17}$ | $-1.000000x_5$ | $-1.000000x_6$ | |
| $x_{16}$ | 4.0 | $+1.000000x_1$ | $-1.333333x_2$ | $-0.666667x_3$ | $+0.666667x_{17}$ | $-4.000000x_5$ | $+2.000000x_6$ | |
| $x_4$ | 1.0 | $+1.000000x_1$ | $+0.666667x_2$ | $+0.333333x_3$ | $-0.333333x_{17}$ | $+1.000000x_5$ | | $+1.000000x_7$ |
| $z$ | 2.0 | | $+0.333333x_2$ | $-1.333333x_3$ | $-0.666667x_{17}$ | $+3.000000x_5$ | $+1.000000x_6$ | $+2.000000x_7$ |

$x_2$ enters and $x_{16}$ leaves

$$
\begin{array}{c|l|l}
x_8 & 8.0 & -0.250000x_1 +1.250000x_{16} -2.500000x_3 -0.500000x_{17} +3.000000x_5 -5.500000x_6 -1.000000x_7 \\
x_9 & 4.0 & +1.000000x_{16} -1.000000x_3 +5.000000x_5 -2.000000x_6 -3.000000x_7 \\
x_{10} & 8.0 & -3.000000x_1 -1.000000x_{16} -4.000000x_3 +1.000000x_{17} -2.000000x_5 +5.000000x_6 +1.000000x_7 \\
x_{11} & 2.0 & -4.500000x_1 +0.500000x_{16} +3.000000x_3 -2.000000x_5 -3.000000x_7 \\
x_{12} & 19.0 & +7.250000x_1 -2.250000x_{16} -2.500000x_3 +0.500000x_{17} -8.000000x_5 +3.500000x_6 +3.000000x_7 \\
x_{13} & 12.0 & +1.000000x_1 +2.000000x_3 -2.000000x_5 +1.000000x_7 \\
x_{14} & 19.0 & +6.750000x_1 -2.750000x_{16} -1.500000x_3 +1.500000x_{17} -7.000000x_5 +7.500000x_6 +2.000000x_7 \\
x_{15} & 4.0 & -1.250000x_1 +1.250000x_{16} +0.500000x_3 -1.500000x_{17} +4.000000x_5 -3.500000x_6 \\
x_2 & 3.0 & +0.750000x_1 -0.750000x_{16} -0.500000x_3 +0.500000x_{17} -3.000000x_5 +1.500000x_6 \\
x_4 & 3.0 & +1.500000x_1 -0.500000x_{16} -1.000000x_5 +1.000000x_6 +1.000000x_7 \\
\hline
z & 3.0 & +0.250000x_1 -0.250000x_{16} -1.500000x_3 -0.500000x_{17} +2.000000x_5 +1.500000x_6 +2.000000x_7 \\
\end{array}
$$

$x_1$ enters and $x_{11}$ leaves

$$
\begin{array}{c|l|l}
x_8 & 7.88888888889 & +0.055556x_{11} +1.222222x_{16} -2.666667x_3 -0.500000x_{17} +3.111111x_5 -5.500000x_6 -0.833333x_7 \\
x_9 & 4.0 & +1.000000x_{16} -1.000000x_3 +5.000000x_5 -2.000000x_6 -3.000000x_7 \\
x_{10} & 6.66666666667 & +0.666667x_{11} -1.333333x_{16} -6.000000x_3 +1.000000x_{17} -0.666667x_5 +5.000000x_6 +3.000000x_7 \\
x_1 & 0.444444444444 & -0.222222x_{11} +0.111111x_{16} +0.666667x_3 -0.444444x_5 -0.666667x_7 \\
x_{12} & 22.2222222222 & -1.611111x_{11} -1.444444x_{16} +2.333333x_3 +0.500000x_{17} -11.222222x_5 +3.500000x_6 -1.833333x_7 \\
x_{13} & 12.4444444444 & -0.222222x_{11} +0.111111x_{16} +2.666667x_3 -2.444444x_5 +0.333333x_7 \\
x_{14} & 22.0 & -1.500000x_{11} -2.000000x_{16} +3.000000x_3 +1.500000x_{17} -10.000000x_5 +7.500000x_6 -2.500000x_7 \\
x_{15} & 3.44444444444 & +0.277778x_{11} +1.111111x_{16} -0.333333x_3 -1.500000x_{17} +4.555556x_5 -3.500000x_6 +0.833333x_7 \\
x_2 & 3.33333333333 & -0.166667x_{11} -0.666667x_{16} +0.500000x_{17} -3.333333x_5 +1.500000x_6 -0.500000x_7 \\
x_4 & 3.66666666667 & -0.333333x_{11} -0.333333x_{16} +1.000000x_3 -1.666667x_5 +1.000000x_6 \\
\hline
z & 3.11111111111 & -0.055556x_{11} -0.222222x_{16} -1.333333x_3 -0.500000x_{17} +1.888889x_5 +1.500000x_6 +1.833333x_7 \\
\end{array}
$$

$x_5$ enters and $x_1$ leaves

$$
\begin{array}{c|l|l}
x_8 & 11.0 & -1.500000x_{11} +2.000000x_{16} +2.000000x_3 -0.500000x_{17} -7.000000x_1 -5.500000x_6 -5.500000x_7 \\
x_9 & 9.0 & -2.500000x_{11} +2.250000x_{16} +6.500000x_3 -11.250000x_1 -2.000000x_6 -10.500000x_7 \\
x_{10} & 6.0 & +1.000000x_{11} -1.500000x_{16} -7.000000x_3 +1.000000x_{17} +1.500000x_1 +5.000000x_6 +4.000000x_7 \\
x_5 & 1.0 & -0.500000x_{11} +0.250000x_{16} +1.500000x_3 -2.250000x_1 -1.500000x_7 \\
x_{12} & 11.0 & +4.000000x_{11} -4.250000x_{16} -14.500000x_3 +0.500000x_{17} +25.250000x_1 +3.500000x_6 +15.000000x_7 \\
x_{13} & 10.0 & +1.000000x_{11} -0.500000x_{16} -1.000000x_3 +5.500000x_1 +4.000000x_7 \\
x_{14} & 12.0 & +3.500000x_{11} -4.500000x_{16} -12.000000x_3 +1.500000x_{17} +22.500000x_1 +7.500000x_6 +12.500000x_7 \\
x_{15} & 8.0 & -2.000000x_{11} +2.250000x_{16} +6.500000x_3 -1.500000x_{17} -10.250000x_1 -3.500000x_6 -6.000000x_7 \\
x_2 & 0.0 & +1.500000x_{11} -1.500000x_{16} -5.000000x_3 +0.500000x_{17} +7.500000x_1 +1.500000x_6 +4.500000x_7 \\
x_4 & 2.0 & +0.500000x_{11} -0.750000x_{16} -1.500000x_3 +3.750000x_1 +1.000000x_6 +2.500000x_7 \\
\hline
z & 5.0 & -1.000000x_{11} +0.250000x_{16} +1.500000x_3 -0.500000x_{17} -4.250000x_1 +1.500000x_6 -1.000000x_7 \\
\end{array}
$$

$x_3$ enters and $x_2$ leaves

$$
\begin{array}{r|l l}
x_8 & 11.0 & -0.900000x_{11} +1.400000x_{16} -0.400000x_2 -0.300000x_{17} -4.000000x_1 -4.900000x_6 -3.700000x_7 \\
x_9 & 9.0 & -0.550000x_{11} +0.300000x_{16} -1.300000x_2 +0.650000x_{17} -1.500000x_1 -0.050000x_6 -4.650000x_7 \\
x_{10} & 6.0 & -1.100000x_{11} +0.600000x_{16} +1.400000x_2 +0.300000x_{17} -9.000000x_1 +2.900000x_6 -2.300000x_7 \\
x_5 & 1.0 & -0.050000x_{11} -0.200000x_{16} -0.300000x_2 +0.150000x_{17} \qquad\quad +0.450000x_6 -0.150000x_7 \\
x_{12} & 11.0 & -0.350000x_{11} +0.100000x_{16} +2.900000x_2 -0.950000x_{17} +3.500000x_1 -0.850000x_6 +1.950000x_7 \\
x_{13} & 10.0 & +0.700000x_{11} -0.200000x_{16} +0.200000x_2 -0.100000x_{17} +4.000000x_1 -0.300000x_6 +3.100000x_7 \\
x_{14} & 12.0 & -0.100000x_{11} -0.900000x_{16} +2.400000x_2 +0.300000x_{17} +4.500000x_1 +3.900000x_6 +1.700000x_7 \\
x_{15} & 8.0 & -0.050000x_{11} +0.300000x_{16} -1.300000x_2 -0.850000x_{17} -0.500000x_1 -1.550000x_6 -0.150000x_7 \\
x_3 & 0.0 & +0.300000x_{11} -0.300000x_{16} -0.200000x_2 +0.100000x_{17} +1.500000x_1 +0.300000x_6 +0.900000x_7 \\
x_4 & 2.0 & +0.050000x_{11} -0.300000x_{16} +0.300000x_2 -0.150000x_{17} +1.500000x_1 +0.550000x_6 +1.150000x_7 \\
\hline
z & 5.0 & -0.550000x_{11} -0.200000x_{16} -0.300000x_2 -0.350000x_{17} -2.000000x_1 +1.950000x_6 +0.350000x_7 \\
\end{array}
$$

$x_6$ enters and $x_8$ leaves

$$
\begin{array}{r|l l}
x_6 & 2.24489795918 & -0.183673x_{11} +0.285714x_{16} -0.081633x_2 -0.061224x_{17} -0.816327x_1 -0.204082x_8 -0.755102x_7 \\
x_9 & 8.88775510204 & -0.540816x_{11} +0.285714x_{16} -1.295918x_2 +0.653061x_{17} -1.459184x_1 +0.010204x_8 -4.612245x_7 \\
x_{10} & 12.5102040816 & -1.632653x_{11} +1.428571x_{16} +1.163265x_2 +0.122449x_{17} -11.367347x_1 -0.591837x_8 -4.489796x_7 \\
x_5 & 2.01020408163 & -0.132653x_{11} -0.071429x_{16} -0.336735x_2 +0.122449x_{17} -0.367347x_1 -0.091837x_8 -0.489796x_7 \\
x_{12} & 9.09183673469 & -0.193878x_{11} -0.142857x_{16} +2.969388x_2 -0.897959x_{17} +4.193878x_1 +0.173469x_8 +2.591837x_7 \\
x_{13} & 9.32653061224 & +0.755102x_{11} -0.285714x_{16} +0.224490x_2 -0.081633x_{17} +4.244898x_1 +0.061224x_8 +3.326531x_7 \\
x_{14} & 20.7551020408 & -0.816327x_{11} +0.214286x_{16} +2.081633x_2 +0.061224x_{17} +1.316327x_1 -0.795918x_8 -1.244898x_7 \\
x_{15} & 4.52040816327 & +0.234694x_{11} -0.142857x_{16} -1.173469x_2 -0.755102x_{17} +0.765306x_1 +0.316327x_8 +1.020408x_7 \\
x_3 & 0.673469387755 & +0.244898x_{11} -0.214286x_{16} -0.224490x_2 +0.081633x_{17} +1.255102x_1 -0.061224x_8 +0.673469x_7 \\
x_4 & 3.23469387755 & -0.051020x_{11} -0.142857x_{16} +0.255102x_2 -0.183673x_{17} +1.051020x_1 -0.112245x_8 +0.734694x_7 \\
\hline
z & 9.37755102041 & -0.908163x_{11} +0.357143x_{16} -0.459184x_2 -0.469388x_{17} -3.591837x_1 -0.397959x_8 -1.122449x_7 \\
\end{array}
$$

$x_{16}$ enters and $x_3$ leaves

$$
\begin{array}{r|l l}
x_6 & 3.14285714286 & +0.142857x_{11} -1.333333x_3 -0.380952x_2 +0.047619x_{17} +0.857143x_1 -0.285714x_8 +0.142857x_7 \\
x_9 & 9.78571428571 & -0.214286x_{11} -1.333333x_3 -1.595238x_2 +0.761905x_{17} +0.214286x_1 -0.071429x_8 -3.714286x_7 \\
x_{10} & 17.0 & \qquad\qquad -6.666667x_3 -0.333333x_2 +0.666667x_{17} -3.000000x_1 -1.000000x_8 +0.000000x_7 \\
x_5 & 1.78571428571 & -0.214286x_{11} +0.333333x_3 -0.261905x_2 +0.095238x_{17} -0.785714x_1 -0.071429x_8 -0.714286x_7 \\
x_{12} & 8.64285714286 & -0.357143x_{11} +0.666667x_3 +3.119048x_2 -0.952381x_{17} +3.357143x_1 +0.214286x_8 +2.142857x_7 \\
x_{13} & 8.42857142857 & +0.428571x_{11} +1.333333x_3 +0.523810x_2 -0.190476x_{17} +2.571429x_1 +0.142857x_8 +2.428571x_7 \\
x_{14} & 21.4285714286 & -0.571429x_{11} -1.000000x_3 +1.857143x_2 +0.142857x_{17} +2.571429x_1 -0.857143x_8 -0.571429x_7 \\
x_{15} & 4.07142857143 & +0.071429x_{11} +0.666667x_3 -1.023810x_2 -0.809524x_{17} -0.071429x_1 +0.357143x_8 +0.571429x_7 \\
x_{16} & 3.14285714286 & +1.142857x_{11} -4.666667x_3 -1.047619x_2 +0.380952x_{17} +5.857143x_1 -0.285714x_8 +3.142857x_7 \\
x_4 & 2.78571428571 & -0.214286x_{11} +0.666667x_3 +0.404762x_2 -0.238095x_{17} +0.214286x_1 -0.071429x_8 +0.285714x_7 \\
\hline
z & 10.5 & -0.500000x_{11} -1.666667x_3 -0.833333x_2 -0.333333x_{17} -1.500000x_1 -0.500000x_8 +0.000000x_7 \\
\end{array}
$$

$x_7$ enters and $x_5$ leaves

| | | |
|---|---|---|
| $x_6$ | 3.5 | $+0.100000x_{11} -1.266667x_3 -0.433333x_2 +0.066667x_{17} +0.700000x_1 -0.300000x_8 -0.200000x_5$ |
| $x_9$ | 0.5 | $+0.900000x_{11} -3.066667x_3 -0.233333x_2 +0.266667x_{17} +4.300000x_1 +0.300000x_8 +5.200000x_5$ |
| $x_{10}$ | 17.0 | $-0.000000x_{11} -6.666667x_3 -0.333333x_2 +0.666667x_{17} -3.000000x_1 -1.000000x_8 -0.000000x_5$ |
| $x_7$ | 2.5 | $-0.300000x_{11} +0.466667x_3 -0.366667x_2 +0.133333x_{17} -1.100000x_1 -0.100000x_8 -1.400000x_5$ |
| $x_{12}$ | 14.0 | $-1.000000x_{11} +1.666667x_3 +2.333333x_2 -0.666667x_{17} +1.000000x_1 +0.000000x_8 -3.000000x_5$ |
| $x_{13}$ | 14.5 | $-0.300000x_{11} +2.466667x_3 -0.366667x_2 +0.133333x_{17} -0.100000x_1 -0.100000x_8 -3.400000x_5$ |
| $x_{14}$ | 20.0 | $-0.400000x_{11} -1.266667x_3 +2.066667x_2 +0.066667x_{17} +3.200000x_1 -0.800000x_8 +0.800000x_5$ |
| $x_{15}$ | 5.5 | $-0.100000x_{11} +0.933333x_3 -1.233333x_2 -0.733333x_{17} -0.700000x_1 +0.300000x_8 -0.800000x_5$ |
| $x_{16}$ | 11.0 | $+0.200000x_{11} -3.200000x_3 -2.200000x_2 +0.800000x_{17} +2.400000x_1 -0.600000x_8 -4.400000x_5$ |
| $x_4$ | 3.5 | $-0.300000x_{11} +0.800000x_3 +0.300000x_2 -0.200000x_{17} -0.100000x_1 -0.100000x_8 -0.400000x_5$ |
| $z$ | 10.5 | $-0.500000x_{11} -1.666667x_3 -0.833333x_2 -0.333333x_{17} -1.500000x_1 -0.500000x_8 -0.000000x_5$ |

$x_{-1}$ enters and Final Dictionary Solution: 10.5 Num Pivots: 8

4