

Practical 5-A

Question 1 $5x+2y+z=10$, $3x+7y+z=21$, $x+y+9z=12$

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In[1]:= n = 3;
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n = 3;
a = {{5, 2, 1}, {3, 7, 4}, {1, 1, 9}};
MatrixForm[a]
x = {0, 0, 0}
y = {0, 0, 0}
b = {10, 21, 12}
For[k = 1, k ≤ 25, k++,
  For[i = 1, i ≤ n, i++,
    y[[i]] =
      (b[[i]] - Sum[a[[i, j]] * x[[j]], {j, 1, i - 1}] - Sum[a[[i, j]] * x[[j]], {j, i + 1, n}]) / a[[i, i]];
  For[m = 1, m ≤ n, m++, x[[m]] = N[y[[m]]]]
  For[p = 1, p ≤ n, p++, Print["x[" , p, "] = ", x[[p]]]]
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Out[4]//MatrixForm=

$$\begin{pmatrix} 5 & 2 & 1 \\ 3 & 7 & 4 \\ 1 & 1 & 9 \end{pmatrix}$$

Out[5]= {0, 0, 0}

Out[6]= {0, 0, 0}

Out[7]= {10, 21, 12}

x[1] = 1.

x[2] = 2.

x[3] = 1.

Question 2 $10x+2y+z=12$, $3x+12y+4z=3$, $2x+5y+15z=11$

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In[10]:= n = 3;
a = {{10, 2, 1}, {3, 12, 4}, {2, 5, 15}};
MatrixForm[a]
x = {0, 0, 0}
y = {0, 0, 0}
b = {12, 3, 11}
For[k = 1, k ≤ 25, k++,
  For[i = 1, i ≤ n, i++,
    y[[i]] =
      (b[[i]] - Sum[a[[i, j]] * x[[j]], {j, 1, i - 1}] - Sum[a[[i, j]] * x[[j]], {j, i + 1, n}]) / a[[i, i]];
    For[m = 1, m ≤ n, m++, x[[m]] = N[y[[m]]]]]
For[p = 1, p ≤ n, p++, Print["x[" , p, "] = ", x[[p]]]]

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Out[12]//MatrixForm=

$$\begin{pmatrix} 10 & 2 & 1 \\ 3 & 12 & 4 \\ 2 & 5 & 15 \end{pmatrix}$$


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Out[13]= {0, 0, 0}

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Out[14]= {0, 0, 0}

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Out[15]= {12, 3, 11}

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x[1] = 1.18721

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x[2] = -0.268293

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x[3] = 0.664469

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