```
In[1]:=   Clear[A]

In[2]:=   A = {{3, 5, 1}, {1, 2, 4}, {5, 2, 1}}; A // MatrixForm

Out[2]//MatrixForm=
          ⎛ 3  5  1 ⎞
          ⎜ 1  2  4 ⎟
          ⎝ 5  2  1 ⎠

In[3]:=   M[3, 1] = A[[1, 2]] * A[[2, 3]] - A[[1, 3]] * A[[2, 2]]

Out[3]=   18

In[4]:=   M[3, 2] = A[[1, 1]] * A[[2, 3]] - A[[1, 3]] * A[[2, 1]]

Out[4]=   11

In[5]:=   M[3, 3] = A[[1, 1]] * A[[2, 2]] - A[[1, 2]] * A[[2, 1]]

Out[5]=   1

In[10]:=  c[3, 1] = M[3, 1]; c[3, 2] = -M[3, 2]; c[3, 3] = M[3, 3];
          detA = A[[3, 1]] * c[3, 1] + A[[3, 2]] * c[3, 2] + A[[3, 3]] * c[3, 3]

Out[10]=  69

In[11]:=
          M[1, 1] = A[[2, 2]] * A[[3, 3]] - A[[2, 3]] * A[[3, 2]]

Out[11]=  -6

In[12]:=  M[1, 2] = A[[2, 1]] * A[[3, 3]] - A[[2, 3]] * A[[3, 1]]

Out[12]=  -19

In[13]:=  M[1, 3] = A[[2, 1]] * A[[3, 2]] - A[[2, 2]] * A[[3, 1]]

Out[13]=  -8

In[14]:=
          M[2, 1] = A[[1, 2]] * A[[3, 3]] - A[[1, 3]] * A[[3, 2]]

Out[14]=  3

In[15]:=  M[2, 2] = A[[1, 1]] * A[[3, 3]] - A[[1, 3]] * A[[3, 1]]

Out[15]=  -2

In[16]:=  M[2, 3] = A[[1, 1]] * A[[3, 2]] - A[[1, 2]] * A[[3, 1]]

Out[16]=  -19

In[17]:=
          M[3, 1] = A[[1, 2]] * A[[2, 3]] - A[[1, 3]] * A[[2, 2]]

Out[17]=  18
```

In[18]:= `M[3, 2] = A[[1, 1]] * A[[2, 3]] - A[[1, 3]] * A[[2, 1]]`

Out[18]= 11

In[19]:= `M[3, 3] = A[[1, 1]] * A[[2, 2]] - A[[1, 2]] * A[[2, 1]]`

Out[19]= 1

In[20]:= `Minor = Table[M[i, j], {i, 3}, {j, 3}]; Minor // MatrixForm`

Out[20]//MatrixForm=

$$\begin{pmatrix} -6 & -19 & -8 \\ 3 & -2 & -19 \\ 18 & 11 & 1 \end{pmatrix}$$

In[21]:= `c[2, 1] = -M[2, 1]; c[2, 2] = M[2, 2]; c[2, 3] = -M[3, 3];`
`matkof = Table[If[EvenQ[i + j], M[i, j], -M[i, j]], {i, 3}, {j, 3}]; matkof // MatrixForm`

Out[21]//MatrixForm=

$$\begin{pmatrix} -6 & 19 & -8 \\ -3 & -2 & 19 \\ 18 & -11 & 1 \end{pmatrix}$$

In[22]:= `adjA = Transpose[matkof]; adjA // MatrixForm`

Out[22]//MatrixForm=

$$\begin{pmatrix} -6 & -3 & 18 \\ 19 & -2 & -11 \\ -8 & 19 & 1 \end{pmatrix}$$

In[23]:= `invA = 1 / detA + adjA; invA // MatrixForm`

Out[23]//MatrixForm=

$$\begin{pmatrix} -\frac{413}{69} & -\frac{206}{69} & \frac{1243}{69} \\ \frac{1312}{69} & -\frac{137}{69} & -\frac{758}{69} \\ -\frac{551}{69} & \frac{1312}{69} & \frac{70}{69} \end{pmatrix}$$

In[24]:=

`Clear[B]`

In[27]:= `B = {{2, 1, -1}, {1, 2, 1}, {-1, 2, 2}}; B // MatrixForm`

Out[27]//MatrixForm=

$$\begin{pmatrix} 2 & 1 & -1 \\ 1 & 2 & 1 \\ -1 & 2 & 2 \end{pmatrix}$$

In[29]:= `M[3, 1] = B[[1, 2]] * B[[2, 3]] - B[[1, 3]] * B[[2, 2]]`

Out[29]= 3

In[30]:= `M[3, 2] = B[[1, 1]] * B[[2, 3]] - B[[1, 3]] * B[[2, 1]]`

Out[30]= 3

In[31]:= `M[3, 3] = B[[1, 1]] * B[[2, 2]] - B[[1, 2]] * B[[2, 1]]`

Out[31]= 3

In[32]:= `c[3, 1] = M[3, 1]; c[3, 2] = -M[3, 2]; c[3, 3] = M[3, 3];`
`detA = B[[3, 1]] * c[3, 1] + B[[3, 2]] * c[3, 2] + B[[3, 3]] * c[3, 3]`

Out[32]= -3

In[33]:= `M[1, 1] = B[[2, 2]] * B[[3, 3]] - B[[2, 3]] * B[[3, 2]]`

Out[33]= 2

In[34]:= `M[1, 2] = B[[2, 1]] * B[[3, 3]] - B[[2, 3]] * B[[3, 1]]`

Out[34]= 3

`M[1, 3] = B[[2, 1]] * B[[3, 2]] - B[[2, 2]] * B[[3, 1]]`

Out[35]= 4

In[36]:= `M[2, 1] = B[[1, 2]] * B[[3, 3]] - B[[1, 3]] * B[[3, 2]]`

Out[36]= 4

In[37]:= `M[2, 2] = B[[1, 1]] * B[[3, 3]] - B[[1, 3]] * B[[3, 1]]`

Out[37]= 3

In[38]:= `M[2, 3] = B[[1, 1]] * B[[3, 2]] - B[[1, 2]] * B[[3, 1]]`

Out[38]= 5

In[39]:= `M[3, 1] = B[[1, 2]] * B[[2, 3]] - B[[1, 3]] * B[[2, 2]]`

Out[39]= 3

In[40]:= `M[3, 2] = B[[1, 1]] * B[[2, 3]] - B[[1, 3]] * B[[2, 1]]`

Out[40]= 3

In[41]:= `M[3, 3] = B[[1, 1]] * B[[2, 2]] - B[[1, 2]] * B[[2, 1]]`

Out[41]= 3

In[42]:= `Minor = Table[M[i, j], {i, 3}, {j, 3}]; Minor // MatrixForm`

Out[42]//MatrixForm=

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

In[43]:= `c[2, 1] = -M[2, 1]; c[2, 2] = M[2, 2]; c[2, 3] = -M[3, 3];`
`matkof = Table[If[EvenQ[i + j], M[i, j], -M[i, j]], {i, 3}, {j, 3}]; matkof // MatrixForm`

Out[43]//MatrixForm=

$$\begin{pmatrix} 2 & -3 & 4 \\ -4 & 3 & -5 \\ 3 & -3 & 3 \end{pmatrix}$$