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import numpy as np

def exchange(M, i, j):
    M[i], M[j] = M[j].copy(), M[i].copy()

def transvection(M, i, j, l):
    M[i] = M[i] + l * M[j]

def dilatation(M, i, l):
    M[i] = l*M[i]

def pivot(M, j):
    for i in range(j, len(M)):
        if M[i][j] != 0:
            return i

def descente(M):
    for j in range(len(M[0]) - 1):
        exchange(M, j, pivot(M, j))
        for i in range(j+1, len(M)):
            transvection(M, i, j, -M[i][j]/M[j][j])

def remontee(M):
    for j in range(len(M[0]) - 2, -1, -1):
        for i in range(0, j):
            transvection(M, i, j, -M[i][j]/M[j][j])

def gauss(M):
    descente(M)
    remontee(M)
    for i in range(len(M)):
        dilatation(M, i, 1/M[i, i])

M1 = np.array([[ -2.0, 4.0, 1.0, -18.0], [ 8.0, 2.0, -1.0, 6.0], [ 2.0, -1.0, 2.0, 27.0]])
gauss(M1)
print(M1)

```