```
Problema 2:
Matriz aumentada:
[[ 10   8   9 170]
 [  5  10   4 117]
 [  2   4   8  98]]
alpha_0:
[[0. ]
 [0.5]
 [0.2]]
e_0:
[1. 0. 0.]
alpha_0 * e_0:
[[0.  0.  0. ]
 [0.5 0.  0. ]
 [0.2 0.  0. ]]

L_0:
[[ 1.   0.   0. ]
 [-0.5  1.   0. ]
 [-0.2  0.   1. ]]

L_0 * A_b:
[[ 10.    8.    9.  170. ]
 [  0.    6.   -0.5  32. ]
 [  0.    2.4   6.2  64. ]]
alpha_1:
[[0. ]
 [0. ]
 [0.4]]
e_1:
[0. 1. 0.]
alpha_1 * e_1:
[[0.  0.  0. ]
 [0.  0.  0. ]
 [0.  0.4 0. ]]

L_1:
[[ 1.   0.   0. ]
 [ 0.   1.   0. ]
 [ 0.  -0.4  1. ]]

L_1 * A_b:
[[ 10.    8.    9.  170. ]
 [  0.    6.   -0.5  32. ]
 [  0.    0.    6.4  51.2]]
alpha_2:
[[0.]
 [0.]
 [0.]]
e_2:
[0. 0. 1.]
alpha_2 * e_2:
[[0. 0. 0.]
 [0. 0. 0.]
 [0. 0. 0.]]

L_2:
[[1. 0. 0.]
 [0. 1. 0.]
 [0. 0. 1.]]
```

```
L_2 * A_b:
[[ 10.    8.    9.  170. ]
 [  0.    6.   -0.5  32. ]
 [  0.    0.    6.4  51.2]]
a_b final:
 [[ 10.    8.    9.  170. ]
 [  0.    6.   -0.5  32. ]
 [  0.    0.    6.4  51.2]]
L:
[[1.  0.  0. ]
 [0.5 1.  0. ]
 [0.2 0.4 1. ]]

U:
[[10.   8.   9. ]
 [ 0.   6.  -0.5]
 [ 0.   0.   6.4]]
La solución es: [5. 6. 8.]



Problema 3:
f_1:
 [-13  -3]
J:
 [[ 2  2]
 [ 1 -1]]
Jinv:
 [[ 0.25  0.5 ]
 [ 0.25 -0.5 ]]
x_1, 5.75, 2.75
f_2:
 [25.625  0.   ]
J:
 [[11.5  5.5]
 [ 1.  -1. ]]
Jinv:
 [[ 0.05882353  0.32352941]
 [ 0.05882353 -0.67647059]]
x_2, 4.242647058823529, 1.2426470588235294
f_3:
 [ 4.54422578e+00 -4.44089210e-16]
J:
 [[ 8.48529412  2.48529412]
 [ 1.         -1.        ]]
Jinv:
 [[ 0.09115282  0.22654155]
 [ 0.09115282 -0.77345845]]
x_3, 3.828428087052515, 0.8284280870525152
f_4:
 [0.34315471 0.        ]
J:
 [[ 7.65685617  1.65685617]
 [ 1.         -1.        ]]
Jinv:
 [[ 0.10736857  0.17789428]
 [ 0.10736857 -0.82210572]]
x_4, 3.791584055336631, 0.7915840553366313
f_5:
```

```
 [0.00271497 0.        ]
J:
 [[ 7.58316811  1.58316811]
 [ 1.         -1.        ]]
Jinv:
 [[ 0.10909484  0.17271547]
 [ 0.10909484 -0.82728453]]
x_5, 3.791287866621685, 0.7912878666216856
Se obtuvo x: [3.79128787 0.79128787] con 5 iteraciones.

Problema 4:
y: [1 0 0].
A^1 @ y : [0.   0.18 0.  ].
A^2 @ y : [0.     0.     0.1278].
Nuestra matriz de coeficientes quedó como:
[[0.     0.     1.    ]
 [0.     0.18   0.    ]
 [0.1278 0.     0.    ]]
Nuestra matriz de términos independientes es:
[-0.042174 -0.       -0.120132]
a_b final:
 [[ 0.1278    0.        0.       -0.120132]
 [ 0.        0.18      0.        0.      ]
 [ 0.        0.        1.       -0.042174]]
Coeficientes: [-0.94      0.       -0.042174]

Buscando valores propios.
Usando potencia
Vector arbitrario no escogido.
Se usará w = [1 1 ...1]
y_1: [0.33 0.18 1.65].
lambda_1: 1.6922765731404545.
x_1: [0.19500359 0.10636559 0.97501793]
y_2: [0.32175592 0.03510065 0.99203642].
lambda_2: 1.0435014095358621.
x_2: [0.30834258 0.03363737 0.95068048]
y_3: [0.31372456 0.05550166 0.91752219].
lambda_3: 0.9712623229550993.
x_3: [0.32300703 0.05714385 0.9446698 ]
y_4: [0.31174104 0.05814127 0.92856175].
lambda_4: 0.9812185264292085.
x_4: [0.31770806 0.05925415 0.94633532]
y_5: [0.31229065 0.05718745 0.93162564].
lambda_5: 0.9842368594427038.
x_5: [0.31729218 0.05810334 0.94654618]
y_6: [0.31236024 0.05711259 0.93100678].
lambda_6: 0.9836688474879152.
x_6: [0.31754613 0.05806079 0.94646363]
y_7: [0.312333   0.0571583  0.93089897].
lambda_7: 0.9835608099711487.
x_7: [0.31755332 0.05811365 0.94645797]
y_8: [0.31233113 0.0571596  0.93093118].
lambda_8: 0.983590780415725.
x_8: [0.31754174 0.05811319 0.94646188]
y_9: [0.31233242 0.05715751 0.93093454].
lambda_9: 0.9835942417197636.
x_9: [0.31754194 0.05811087 0.94646196]
eigen: 0.9835942417197636.
```

```
Usando potencia inversa
Vector arbitrario no escogido.
Se usará w = [1 1 ...1]

y_1: [ 5.55555556 -2.60349979  3.03030303].
lambda_1: 6.8428901149401575.
x_1: [ 0.81187268 -0.38046786  0.44283965]
y_2: [-2.11371036 -2.6334752   2.46022025].
lambda_2: 4.177995544762598.
x_2: [-0.50591494 -0.63032025  0.58885181]
y_15: [ 1.79143425  3.6197137  -2.84951376].
lambda_15: 4.942802099008738.
x_15: [ 0.36243293  0.73232017 -0.57649764]
y_16: [ 4.06844541 -2.26603149  1.09828161].
lambda_16: 4.784701587625419.
x_16: [ 0.85030285 -0.47359933  0.22954025]
y_17: [-2.63110741 -3.08807682  2.57667531].
lambda_17: 4.806058712841176.
x_17: [-0.54745636 -0.64253831  0.53613064]
y_18: [-3.56965725  2.95148139 -1.65895867].
lambda_18: 4.919943002750179.
x_18: [-0.7255485   0.59990154 -0.33719063]
y_19: [ 3.33278634  2.43594827 -2.19863181].
lambda_19: 4.677102799477191.
x_19: [ 0.71257496  0.52082419 -0.47008413]
y_20: [ 2.89346772 -3.52090578  2.15931806].
lambda_20: 5.042974068642333.
x_20: [ 0.57376216 -0.69818043  0.42818345]
y_21: [-3.87878015 -1.69883011  1.73867323].
lambda_21: 4.5775477876605715.
x_21: [-0.84734891 -0.37112231  0.37982634]
lambda_28: 5.057066934603925.
x_28: [-0.17731693 -0.78671189  0.59130627]
y_29: [-4.37062162  1.54421248 -0.53732403].
lambda_29: 4.666437895061829.
x_29: [-0.93660769  0.3309189  -0.11514651]
y_30: [ 1.83843831  3.5954455  -2.83820512].
lambda_30: 4.935837528201012.
x_30: [ 0.37246735  0.72843676 -0.57501996]
y_31: [ 4.04687089 -2.30420783  1.12868893].
lambda_31: 4.7917091402730785.
x_31: [ 0.84455687 -0.48087389  0.23555039]
y_32: [-2.67152163 -3.05655926  2.55926326].
lambda_32: 4.79889682817774.
x_32: [-0.55669495 -0.63692956  0.53330241]
lambda_85: 4.527156942210137.
x_85: [-0.99289768  0.01900267  0.11744405]
y_86: [ 0.10557037  4.14887047 -3.00878083].
lambda_97: 5.145467474276456.
x_97: [-0.35422525  0.77983321 -0.51612463]
y_98: [ 4.33240671  0.69419807 -1.07340986].
lambda_98: 4.5170640432127644.
x_98: [ 0.95912005  0.15368347 -0.23763441]
y_99: [ 0.85379705 -4.18263853  2.90642441].
lambda_99: 5.164371913614432.
x_99: [ 0.16532447 -0.80990266  0.56278371]
y_100: [-4.4994592   0.12937953  0.50098324].
lambda_100: 4.529112090305067.
x_100: [-0.99345282  0.0285662   0.11061401]
```

```
eigen^-1: 4.529112090305067.
eigen : 0.22079382891418858
```