```
>> #Ricardo Lucas Fernández
>>
>> #45135839H (abajo)
>>
>> A = [4 5 1; 3 5 8; 3 9 0; 1 0 1]
A =

     4     5     1
     3     5     8
     3     9     0
     1     0     1

>> I = [ 1 0 0; 0 1 0; 0 0 1]
I =

     1     0     0
     0     1     0
     0     0     1

>> AI = [A I]
error: horizontal dimensions mismatch (4x3 vs 3x3)
>> I = [ 1 0 0; 0 1 0 ; 1 0; 0 0 1 ]
error: vertical dimensions mismatch (2x3 vs 1x2)
>> I = [ 1 0 0; 0 1 0 ; 0 0 1 ]
I =

     1     0     0
     0     1     0
     0     0     1

>> AI = [A I]
```

error: horizontal dimensions mismatch (4x3 vs 3x3)

```
>> I = [ 1 0 0; 0 1 0 ; 0 0 1 ; 0 0 0]
```

I =

1	0	0
0	1	0
0	0	1
0	0	0

```
>> AI = [A I]
```

AI =

4	5	1	1	0	0
3	5	8	0	1	0
3	9	0	0	0	1
1	0	1	0	0	0

```
>> rref(A)
```

ans =

1	0	0
0	1	0
0	0	1
0	0	0

```
>> rref(AI)
```

ans =

1	0	0	0	-3/20	1/12
0	1	0	0	1/20	1/12
0	0	1	0	3/20	-1/12

0 0 0 1 1/5 -2/3

>> #Por lo tanto nos queda la matriz canonica a la izq (3 primeras columnas) y a la dech la de paso

>> #AC = E * A

>> E * A

Ejercicio 2

>> #a)

>>

>> A = [4 4 4;]

A =

4 4 4

>> A = [4 4 4; 5 5 -5; 1 0 1; 3 0 3]

A =

4 4 4

5 5 -5

1 0 1

3 0 3

>> b = [24; 0; 4; 9]

b =

24

0

4

9

```
>> rank(A)
ans =  3
>> Ab = [A b]
Ab =

   4   4   4  24
   5   5  -5   0
   1   0   1   4
   3   0   3   9

>> rank(Ab)
ans =  4
>> #Sistema Incompatible
```

b)

```
A = [5 5 5 -15 10; 8 16 -16 -40 -16; 9 -3 -9 -3 12]
A =

    5     5     5   -15    10
    8    16   -16   -40   -16
    9    -3    -9    -3    12

>> b = [20; -24; 12]
b =

   20
```

-24

12

>> Ab = [A b]

Ab =

5 5 5 -15 10 20

8 16 -16 -40 -16 -24

9 -3 -9 -3 12 12

>> rank(A)

ans = 3

>> rank(Ab)

ans = 3

>>>> # es un sistema compatible indeterminado, ya que los rangos son iguales pero distinto que el

>> #n_incognitas

>> # 5 - 3 = 2 -parametros (depende de dos parametros)

>> # t = alpha

>> # w = beta

>>

>> #8x + 8y + 8z = 32 - 24alpha - 16beta)

c)

>> A = [9 9 9 54; 1 1 -1; 6 -6 0]

error: vertical dimensions mismatch (1x4 vs 1x3)

>> A = [9 9 9; 1 1 -1; 6 -6 0]

```
A =

   9   9   9
   1   1  -1
   6  -6   0

>> b = [54; 0; 3]
b =

  54
   0
   3

>> rank(A)
ans =  3
>> rank(Ab)
ans =  3
>> #Es un sistema compatible determinado ya que el numero incognitas = rank(A) = rank(Ab)
>> A\b
ans =

   1.7500
   1.2500
   3.0000

>> format rat
>> A\b
ans =

       7/4
       5/4
```

```
        3

>> #x=7/4, y=5/4, z=3, Soluciones del sistema compatible determinado

>> #3)
>> A=[4 -5 -1; 1 5 0]
A =

        4        -5        -1
        1         5         0

>> b= [0; 0]
b =

        0
        0

>> AB = [A b]
AB =

        4        -5        -1         0
        1         5         0         0

>> #Es un sistema homogeno.
>>
>> rank(A)
ans = 2
>> rank(AB)
ans = 2

>> rref([A AB])
```

```
ans =

    1    0   -1/5    1    0   -1/5    0
    0    1   1/25    0    1   1/25    0

>>
```

6)

```
>> A = [4 1 -1 1; 0 5 1 -1; 0 0 2 3]
A =

    4    1   -1    1
    0    5    1   -1
    0    0    2    3

>> eig(A)
error: eig: A must be a square matrix
>> [P,D] = eig(A)
error: eig: A must be a square matrix
>> A = [4 1 -1 1; 0 5 1 -1; 0 0 2 3]
A =

    4    1   -1    1
    0    5    1   -1
    0    0    2    3

>> [P,D] = eig(A)
error: eig: A must be a square matrix
>> A = [4 1 -1 1; 0 5 1 -1; 0 0 1 1 ;0 0 0 3]
A =
```

```
     4     1    -1     1
     0     5     1    -1
     0     0     1     1
     0     0     0     3
```

```
>> [P,D] = eig(A)
P =

     1  5741/8119  3401/9075   -505/922
     0  5741/8119  -360/1601   966/5291
     0        0  3041/3381  1932/5291
     0        0        0  3864/5291

D =

Diagonal Matrix

     4     0     0     0
     0     5     0     0
     0     0     1     0
     0     0     0     3

>> eig(A)
ans =

     4
     5
     1
     3

>> [P,D] = eig(A)
```

P =

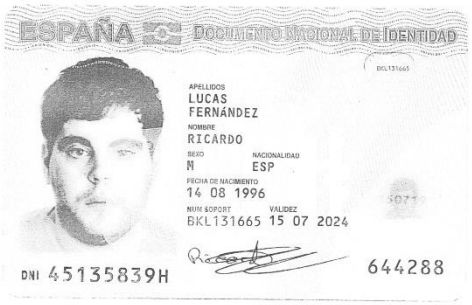
1	5741/8119	3401/9075	-505/922
0	5741/8119	-360/1601	966/5291
0	0	3041/3381	1932/5291
0	0	0	3864/5291

D =

Diagonal Matrix

4	0	0	0
0	5	0	0
0	0	1	0
0	0	0	3

>> #No es diagonalizable ya que tendria que tener 3 autovectores diferentes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