­

|  |  |  |  |
| --- | --- | --- | --- |
| -1 | 1 | 2 | 1 |
| 2 | 3 | 1 | -2 |
| 5 | 4 | 2 | 4 |

R1=-r1

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | -2 | -1 |
| 2 | 3 | 1 | -2 |
| 5 | 4 | 2 | 4 |

R2=-2r1+r2;r3=-5r1+r3

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | -2 | -1 |
| 0 | 5 | 5 | 0 |
| 0 | 9 | 12 | 9 |

R2=r2/5

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | -2 | -1 |
| 0 | 1 | 1 | 0 |
| 0 | 9 | 12 | 9 |

R3=r3-9r2

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | -2 | -1 |
| 0 | 1 | 1 | 0 |
| 0 | 0 | 3 | 9 |

R3=r3/3

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | -2 | -1 |
| 0 | 1 | 1 | 0 |
| 0 | 0 | 1 | 3 |

R2=r2-r3; r1= r1+2r3

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | 0 | 5 |
| 0 | 1 | 0 | -3 |
| 0 | 0 | 1 | 3 |

R1=r1+r2

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 0 | 0 | 2 |
| 0 | 1 | 0 | -3 |
| 0 | 0 | 1 | 3 |

**X1=2**

**X2=-3**

**X3=3**

|  |  |  |  |
| --- | --- | --- | --- |
| 2 | 3 | 1 | 10 |
| 2 | -3 | -3 | 22 |
| 4 | -2 | 3 | -2 |

R1=r1+r2;r2=r2=r3

|  |  |  |  |
| --- | --- | --- | --- |
| 4 | 0 | -4 | 32 |
| 2 | -3 | -3 | 22 |
| 4 | -2 | 3 | -2 |

R1=r1/4

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 0 | -1 | 8 |
| 2 | -3 | -3 | 22 |
| 4 | -2 | 3 | -2 |

R2=r2-2r1;r3=r3-4r1

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 0 | -1 | 8 |
| 0 | -3 | -1 | 6 |
| 0 | -2 | 7 | -34 |

R2=r2-r3

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 0 | -1 | 8 |
| 0 | -1 | -8 | 40 |
| 0 | -2 | 7 | -34 |

R2=-r2

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 0 | -1 | 8 |
| 0 | 1 | 8 | -40 |
| 0 | -2 | 7 | -34 |

R3=r3+2r2

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 0 | -1 | 8 |
| 0 | 1 | 8 | -40 |
| 0 | 0 | 23 | -114 |

|  |  |  |
| --- | --- | --- |
| 1 | -1 | 2 |
| -1 | 1 | -1 |
| 1 | k | 1 |

R2=r1+r2; r3=r3-r1

|  |  |  |
| --- | --- | --- |
| 1 | -1 | 2 |
| 0 | 0 | 1 |
| 0 | K+1 | -1 |

R3<->r2

|  |  |  |
| --- | --- | --- |
| 1 | -1 | 2 |
| 0 | K+1 | -1 |
| 0 | 0 | 1 |

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 1 |
| 1 | 1 | -1 |
| 1 | 1 | K |

R2=r2-r1; r3=r3-r1

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 1 |
| 0 | 0 | -2 |
| 0 | 0 | K-1 |

R2=r2/-2

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 1 |
| 0 | 0 | 1 |
| 0 | 0 | K-1 |

Với mọi k

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 1 |
| 0 | 0 | 1 |
| 0 | 0 | 0 |

R1=r1-r2

|  |  |  |
| --- | --- | --- |
| 1 | 1 | 0 |
| 0 | 0 | 1 |
| 0 | 0 | 0 |

X1=t

X2=-t

X3=0

|  |  |  |
| --- | --- | --- |
| 1 | 1 | -1 |
| 0 | k | -1 |
| 1 | 1 | k |

R3=r3-r1

|  |  |  |
| --- | --- | --- |
| 1 | 1 | -1 |
| 0 | k | -1 |
| 0 | 0 | K+1 |

K=-1(k+1=0) hoặc k+1=1 ⬄ k=-1 hoặc k=0

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | 2 | M |
| -1 | 1 | -1 | 0 |
| -1 | m | -1 | 1-m |

R2=r2+r1; r3=r3+r1

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | 2 | M |
| 0 | 0 | 1 | m |
| 0 | m-1 | 1 | 1 |

R2<->r3

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | 2 | M |
| 0 | m-1 | 1 | 1 |
| 0 | 0 | 1 | M |

m-1<>0

|  |  |  |  |
| --- | --- | --- | --- |
| m | 1 | 1 | 1 |
| 1 | m | 1 | m |
| 1 | 1 | m | m^2 |

R1<->r3

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | m | m^2 |
| 1 | m | 1 | m |
| m | 1 | 1 | 1 |

R3= mr2=r3

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | m | m^2 |
| 0 | m-1 | 1-m | m-m^2 |
| 0 | m^2-1 | m-1 | m^-1 |

m-1<>0

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | m | m^2 |
| 0 | 1 | -1 | -m |
| 0 | m+1 | 1 | m+1 |

\\* Lập tỉ lệ r2/r3 \*\

M+1<>-1⬄m<>-2

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | m | m^2 |
| 0 | 1 | -1 | -m |
| 0 | 1 | 1/(m+1) | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | m | m^2 |
| 0 | 1 | -1 | -m |
| 0 |  | 1 | (1-m^2)/(2+m) |

ĐK: m<>-2

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 1 |
| 1 | m | 2 | m |
| 1 | 2 | 1 | 2 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 1 |
| 0 | m-1 | 3 | m-1 |
| 0 | 1 | 2 | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 1 |
| 0 | 1 | 2 | 1 |
| 0 | m-1 | 3 | m-1 |

1/(m-1) <> 2/3

⬄ m-1⬄6 ⬄m=5 và m<>1

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | m | -m | m |
| 2 | 1 | -1 | 2 |
| 1 | 1 | 1 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | 1 | 0 |
| 0 | -1 | -3 | 2 |
| 1 | m | -m | m |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | 1 | 0 |
| 0 | 1 | 3 | -2 |
| 0 | m-1 | -m-1 | m |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | 1 | 0 |
| 0 | 1 | 3 | -2 |
| 0 | 0 | -4m+2 | 3m-2 |

Để có duy nhất 1 nghiệm -4m+2<>0 ⬄ m<>1/2

5)

a)

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | 2 | m |
| -1 | 1 | -1 | 0 |
| 1 | -1 | 3 | 1-m |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | 1 | 0 |
| 1 | -1 | 2 | m |
| 1 | -1 | 3 | 1-m |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | 1 | 0 |
| 0 | 0 | 1 | m |
| 0 | 0 | 2 | 1-m |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -1 | 1 | 0 |
| 0 | 0 | 1 | m |
| 0 | 0 | 1 | (1-m)/2 |

Để hệ PT vô nghiệm

m<>(1-m)/2

⬄ 2m<>1-m

⬄ m<>1/3

b)

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -2 | 2 | m |
| 1 | m | -1 | 0 |
| 2 | 1 | m | 2-m |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -2 | 2 | m |
| 0 | m+2 | -3 | -m |
| 0 | 5 | m-4 | 2-3m |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -2 | 2 | m |
| 0 | 1 | (m-4)/5 | (2-3m)/5 |
| 0 | m+2 | -3 | -m |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | -2 | 2 | m |
| 0 | 1 | (m-4)/5 | (2-3m)/5 |
| 0 | 0 | -(m^2)/5+2m/5-7/5 | -m |

-3-(m+2)(m-4)/5=-3-(m^2-2m-8)/5=-(m^2)/5+2m/5-7/5

Vô nghiệm khi m<>0 và –(m^2)+2m-7=0

* Không tồn tại m

6)

Thế (3;-1;2) vào hệ =>

3+-a+2c=0

3b-c-6=1

3a-2+2b=5

|  |  |  |  |
| --- | --- | --- | --- |
| -1 | 0 | 2 | -3 |
| 0 | 3 | -1 | 7 |
| 3 | 2 | 0 | 7 |

|  |  |  |  |
| --- | --- | --- | --- |
| 3 | 2 | 0 | 7 |
| 0 | 3 | -1 | 7 |
| -1 | 0 | 2 | -3 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 2/3 | 0 | 7/3 |
| 0 | 1 | -1/3 | 7/3 |
| 0 | 2/3 | 2 | -2/3 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 2/3 | 0 | 7/3 |
| 0 | 1 | -1/3 | 7/3 |
| 0 | 0 | 20/9 | -20/9 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 2/3 | 0 | 7/3 |
| 0 | 1 | -1/3 | 7/3 |
| 0 | 0 | 1 | -1 |

* c=-1 =>b=2 => a=1

7)

a) there are 3 equations and 2 variables

b)

|  |  |  |
| --- | --- | --- |
| 2 | -1 | 3 |
| -4 | 2 | k |
| 4 | -2 | 6 |

|  |  |  |
| --- | --- | --- |
| 2 | -1 | 3 |
| 0 | 4 | k+6 |
| 0 | -4 | 0 |

the system is consistent when k+6=0 ⬄ k=-6

c) 3 equations and 3 variables

d) a homogenerous always has at least 1 solution with any k

8)

a)

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 2 |
| 1 | 2 | 1 | 3 |
| 1 | 1 | k^2-5 | k |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 2 |
| 0 | 1 | 2 | 1 |
| 0 | 0 | k^2-4 | k-2 |

The system of equations has no solution when k^2-4=0 and k-2<>0

⬄ k=2 or k=-2 and k<>2 ⬄ k=-2

b)

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 1 |
| 2 | k+5 | -2 | 4 |
| 1 | k+3 | k-1 | k+3 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 1 |
| 0 | 1 | 0 | 2/(k+3) |
| 0 | k+2 | k | k+2 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 1 |
| 0 | 1 | 0 | 2/(k+3) |
| 0 | 1 | k/(k+2) | 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | -1 | 1 |
| 0 | 1 | 0 | 2/(k+3) |
| 0 | 0 | k/(k+2) | 1-2/(k+3) |

No solution when

k/(k+2)=0 and (k+1)/(k+3)<>0

⬄ k=0 and k=-3

9)

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | 3 | 2 |
| 1 | 2 | 5 | 1 |
| 2 | 2 | a | b |

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | 1 | 3 | 2 |
| 0 | 1 | 2 | -1 |
| 0 | 0 | a-6 | b-4 |

The system has no solution when b-4<>0 and a-6=0

⬄ b<>4 and a=6