CONJUNTO 1.3

15)

18. (Recommended) It is impossible for a system of linear equations to have exactly two solutions. *Explain why.*

(a) If (x,y,z) and (X,Y,Z) are two solutions, what is another one?

(b) If 25 planes meet at two points, where else do they meet?

22)

20. Find the pivots and the solution for these four equations:

$$\begin{aligned} 2x + y &= 0 \\ x + 2y + z &= 0 \\ y + 2z + t &= 0 \\ z + 2t &= 5. \end{aligned}$$

CONJUNTO 1.4

8)

8. Do these subroutines multiply Ax *by rows or columns*? Start with $B(I) = 0$:

```
      DO 10 I = 1, N                    DO 10 J = 1, N
      DO 10 J = 1, N                    DO 10 I = 1, N
10    B(I) = B(I) + A(I,J) * X(J)   10  B(I) = B(I) + A(I,J) * X(J)
```

The outputs $Bx = Ax$ are the same. The second code is slightly more efficient in FORTRAN and much more efficient on a vector machine (the first changes single entries $B(I)$, the second can update whole vectors).

9)

12. The product of two lower triangular matrices is again lower triangular (all its entries above the main diagonal are zero). Confirm this with a 3 by 3 example, and then explain how it follows from the laws of matrix multiplication.