

2(c) If Nul(c)={0}, then the only solution to Ax= o is x= o is the only solution. 1 Salution, where & FIR and Cheeds a pisot Which isn't a guaranteed; sinder all on Know is columns of Care linearly independent which just guarantees a pirotine ach column 3 a) Since I is one-to-one, the columns Tare linearly independent. Additionally, since Tislinear T(x+y) = T(x)+T(y)

For B' to be a basis, {T(b,), ... T(bn)} must

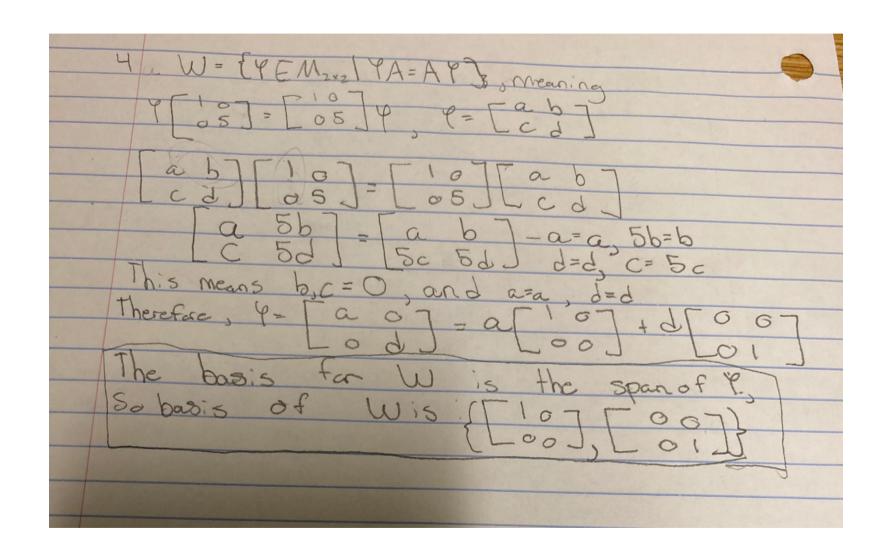
be linear independent and B' must span IR"

To prove B' is linearly independent,

C, T(b,) + C, T(b,) + ... CnT(bn) = C, C, ... Cn = 0. To prove by property C,TCb,) = TCC,b,) swe get (C,b,+ C2 62+.... Cnbn)=0 Since (b)... bad is a basis for IR", the equation To prove (TCb,). TCbn) spans IR" for C, C, OEIR, C,TCb,) + C,TCb2). CnTCbn) = wot where wEIR" sneed to show the system is consistent.
We can rearrange the equation as TCG, by + C2b2: Cnbn)=
We know Tis linear, thus T(X)= I has atmost I solut

By the definition of a basis, the basis of Re where CEIR, has exactly a vectors. This means the basis for Re has a vectors, and the basis for Re has a vectors. B' contains a elements, but since man, maning B' is not a basis for IR. 3c) MKN for T. IR" > IR", By the definition
of a basis, the basis of IR" has n
vectors and the basis for IR" has n
vectors.
Since B' contains n vectors and mens
B' cannot be a basis for IR", as it has n vectors

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