OYUGBO OBEHIOYE CHRISTINE

18/SCI01/078

MATH 204 ASSIGNMENT

QUESTION 1

i). Linear dependence of vectors occurs when the scalars in a linear combination are not all equal to zero. i.e α1u1+α2u2+ α3u3+…+ αnun=0

ii). Linear combination of vectors is a mathematical method of combining vectors using addition and scalar multiplication. i.e α1v1+α2v2+ α3v3+…+ αmum

QUESTION 2 Uα+Vβ+Wγ= (a,b,c) 1 2 1 a 0 α + 1 β + 1 γ = b -1 3 -4 c α + 2β + γ = a ……..(i) β + γ = b ……..(ii) -α + 3β - 4γ = c ……..(iii) From equ (ii) β= b – γ …….(iv) Put equ (iv) into (i) and (iii) α+ 2(b – γ) + γ =a α+ 2b – 2γ + γ =a α+ 2b – γ =a α – γ =a – 2b ……(v) For equ (iii) -α +3(b – γ) - 4γ = c -α +3b – 3γ - 4γ = c -α +3b – 7γ = c -α – 7γ = c – 3b ……...(vi) Compare equs (v) and (vi) by addition α- γ = a – 2b -α - 7γ = c – 3b -8γ = a – 2b + c – 3b -8γ = a – 5b + c γ = (a – 5b + c ) -8 γ = - (a – 5b + c ) 8 γ = -a +5b - c 8 Put γ in (ii) β + -a +5b – c = b 8 β = b - -a +5b – c 8 β = b + a – 5b + c 8 β = 8b + a – 5b + c 8 β = a + 3b + c 8 Put β and γ into equ (i) α + 2 a + 3b + c + -a + 5b – c = a 8 8 α + a + 3b + c + -a +5b – c =a 4 8 α = a - a + 3b + c - -a +5b – c 4 8 α = a – a – 3b – c + a – 5b + c 4 8 α = 8a +2(- a – 3b – c) + a – 5b +c 8 α = 8a – 2a – 6b – 2c + a – 5b + c 8 α = 7a – 11b – c 8 7a – 11b – c U + a + 3b + c V + - a + 5b – c W 8 8 8

QUESTION 3 a. Commutativity of vector addition b. Associativity of vector addition c. Identity element of addition d. Inverse element of addition