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**1i).**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

**1ii).** Linear combination of vectors is a mathematical method of combining vectors using addition and scalar multiplication.

i.e α1v1+α2v2+ α3v3+…+ αmum

**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

IMG_256

-α - 7γ = c – 3b

-8γ = a – 2b + c – 3b

-8γ = a – 5b + c

IMG_257

γ =  (a – 5b + c )

             -8

IMG_258

γ = - (a – 5b + c )

             8

IMG_259

γ = -a +5b - c

            8

Put γ in (ii)

IMG_260

β + -a +5b – c   = b

             8

IMG_261

β = b - -a +5b – c

                   8

IMG_262

β = b + a – 5b + c

                  8

IMG_263

β = 8b + a – 5b + c

                  8

IMG_264

β = a + 3b + c

              8

Put β and γ into equ (i)

IMG_265

IMG_266

α + 2  a + 3b + c  +  -a + 5b – c   = a

                  8                     8

IMG_267

IMG_268

α + a + 3b + c + -a +5b – c   =a

             4                   8

IMG_269

IMG_270

α = a -   a + 3b + c -   -a +5b – c

                    4                     8

IMG_271

IMG_272

α = a – a – 3b – c + a – 5b + c

                    4                  8

IMG_273

α = 8a +2(- a – 3b – c) + a – 5b +c

                                8

IMG_274

α = 8a – 2a – 6b – 2c + a – 5b + c

                                8

IMG_275

α = 7a – 11b – c

                8

IMG_276

IMG_277

IMG_278

       7a – 11b – c  U +   a + 3b + c   V +   - a + 5b – c  W

                8                            8                           8

**3). –**Commutativity of vector addition

**-**Associativity of vector addition

**-**Identity element of addition

**-**Inverse element of addition