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DEPARTMENT: CIVIL ENGINEERING

MATRIC NUMBER: 19/ENG03/017

MATH 102 ASSIGNMENT

1. A = 2i –j B = 3i +j -11k C = 4i +4j -5k

i)

 -3A +7B -8C

-3A = -3(2i –j) = -6i +3j

 7B = 7(3i +j -11k) = 21i +7j -77k

 -8C = -8(4i +4j -5k) = -32i -32j +40k

-3A + 7B = 15i +10j -77k

-3A + 7B -8C = 15i +10j -77k -32i -32j +40k

 = -17i -22j -37k

ii)

K = 2A + 4B –C

2A = 2(2i -j) = 4i -2j

4B = 4(3i +j -11k) = (12i +4j -44k)

2A + 4B = 16i +2j -44k

2A +4B –C = 12i -2j -39k

|K| = = = 40.85

⸫ The direction cosines of K are

Cos α = = 0.2938 cos β =  = -0.0490 cos γ = = -0.9547

 iii)

 A X B X C

 = i(11-0) –j (-22-0) +k(2+3) = 11i +22j +5k = 11i +22j +5k

 = i(-110-20) –j(-55-20) +k(44-88) = -130i + 75j -44k

 iv)

 (

 **3A = 3(2i -j) = -6i -3j**

 **2B = 2(3i +j -11k) = 6i +2j -22k**

 = i(33-0) –j(-66-0) +k(6+9) = 33i +66j +15k

 = i(22-0) –j(-44-0) +k(4+6) = 22i +44j +10k

 ⸫ ( **= (33 x 22) + (66 x 44) + (15 x 10) = 3780**

 **v) A – 2B –C**

 **A -2B = -4i -3j +22k**

 **A -2B –C = -8i -7j +27k**

1. Two vectors A and B are said to be perpendicular if their scalar product is equal to zero

Three vectors A, B and C are said to be coplanar if their triple scalar product [**A.**(**B X C**)] is equal to zero.