

2.4 A frame {B} is located initially coincident with a frame {A}. We rotate {B} about  by 30 degrees, and then we rotate the resulting frame about  by 45 degrees. Give the rotation matrix that will change the description of vectors from to 

Solution:

Based on the requirement, we need to get R whether

 = R.

It means R = R1 .R2

R1 = R(,135 degrees), we rotate {B} about  by 135 degrees

R2 = R(,160 degrees) we the resulting frame about by 160 degrees



2.12. A velocity vector is given by 

Given



compute AV

Solution



2.13 The following frame definitions are given as known:



Draw a frame diagram to show their arrangement qualitatively, and solve for 

Solution:

We rotate {C} about by 30 degrees and keep rotating the result frame about  by 30 degrees and translated 3 units in, and 3 units in, and 3 units in. We have {U}

We rotate {U } about  by 30 degrees and translated 11 units in, and 1 units in, and 8 units in. We have {A}

We have  so 

We rotate {A} about  by 150 degrees and translated 11 units in, and 1 units in, and 8 units in. We have {B}

{U}

{C}

{A}

{B}



2.37.

The (2.4) element of  is the translated 4 units in but it is opposite with Y axes orientation.