

Special Problem 2-5.26

There exists throughout space a **vector field**:

$$\mathbf{A}(\bar{r}) = z \hat{\mathbf{a}}_r + (z^2 - \cos \phi) \hat{\mathbf{a}}_\theta + (\rho z - \sin^2 \phi) \hat{\mathbf{a}}_\phi$$

There also exists in space some **contour C** .

Contour C is a **complete circle!**

At some **arbitrary** point P_a **on** contour C , the vector field has the discrete value:

$$\mathbf{A}(\bar{r} = \bar{r}_a) = 2 \hat{\mathbf{a}}_r + 3 \hat{\mathbf{a}}_\theta + 6 \hat{\mathbf{a}}_\phi$$

At some **other** arbitrary point P_b **on** contour C , the vector field has the discrete value:

$$\mathbf{A}(\bar{r} = \bar{r}_b) = 2 \hat{\mathbf{a}}_r + 4 \hat{\mathbf{a}}_\theta + 5 \hat{\mathbf{a}}_\phi$$

Describe **mathematically** this contour C .