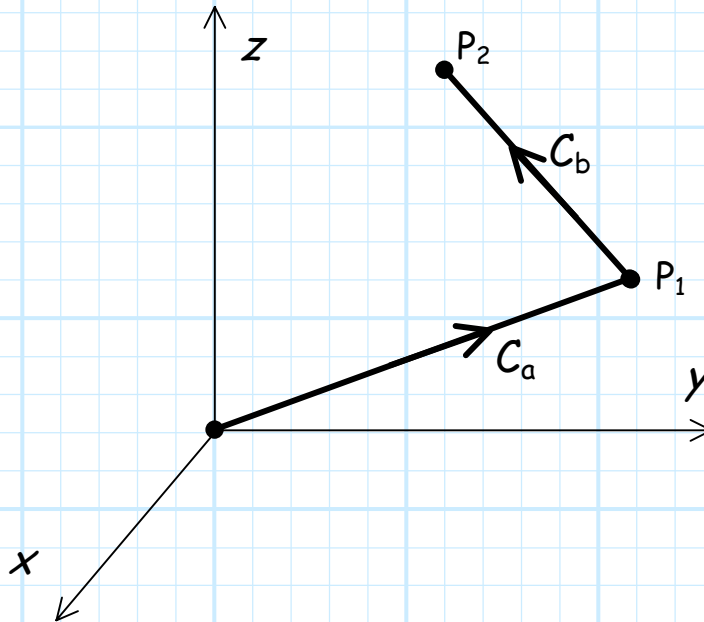


Special Problem 2-5.12

Consider the vector field $\mathbf{A}(\bar{\mathbf{r}}) = \nabla(\rho^2 z)$, and contours C_a and C_b :



Contour C_a starts at the **origin** and **ends** at point P_1 , whereas contour C_b **starts** at point P_1 and **ends** at point P_2 .

The location of point P_2 is denoted by the **position vector** :

$$\bar{\mathbf{r}}_2 = 2 \hat{\mathbf{a}}_y + 3 \hat{\mathbf{a}}_z.$$

If:

$$\int_{C_a} \mathbf{A}(\bar{\mathbf{r}}) \cdot \overline{d\ell} = 5$$

then find the value of integral:

$$\int_{C_b} \mathbf{A}(\bar{\mathbf{r}}) \cdot \overline{d\ell}$$