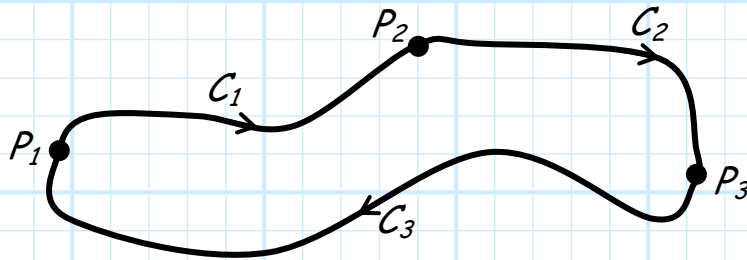


Special Problem 2-5.25

Vector field $\mathbf{A}(\bar{r}) = \nabla g(\bar{r})$, where $g(\bar{r}) = r^2$.

Three points (P_1, P_2, P_3) are connected by three contours (C_1, C_2, C_3) :



The following facts are known:

$$\int_{C_1} \mathbf{A}(\bar{r}) \cdot d\bar{l} = -3 \quad \text{and} \quad \int_{C_3} \mathbf{A}(\bar{r}) \cdot d\bar{l} = -5$$

Likewise, we know that the scalar field $g(\bar{r})$ is equal to **one** at point P_2 (i.e., $g(\bar{r} = \bar{r}_2) = 1$).

How far is point P_3 from the origin (i.e., what is the distance between point P_3 and the origin)?