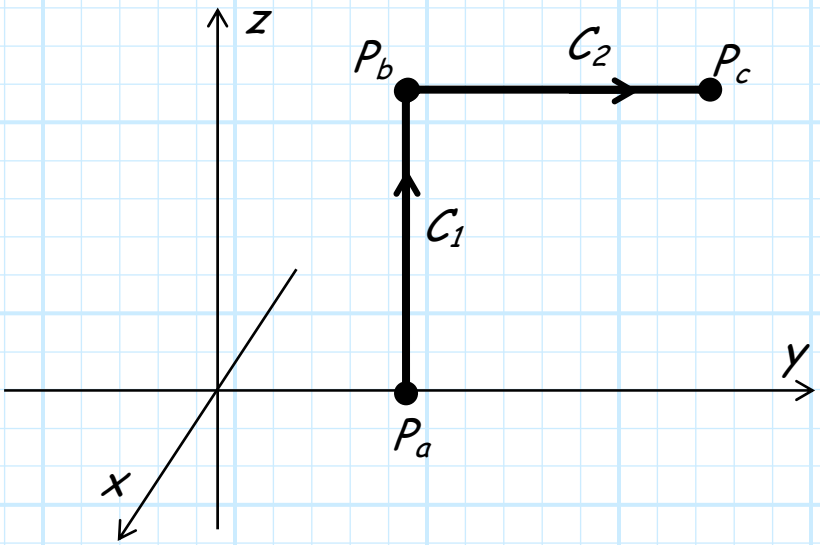
Special Problem 2-5.29

Contour C_1 is a straight line extending from point P_a to point P_b. This contour is **parallel** to the **z-axis**, and lies entirely on the **y-z plane**.

Contour C_2 is a straight line extending from point P_b to point P_c. This contour is **parallel** to the **y-axis**, and lies entirely on the **y-z plane**.



There exists throughout space a vector field $\mathbf{A}(\bar{r}) = \nabla\left(\rho^2 - z\right)$.

It is know that point P_a is located at coordinates (x=0, y=2, z=0).

It is also known that:

$$\int_{C_1} \mathbf{A}(\bar{r}) \cdot \overline{d\ell} = -3 \qquad \text{and} \qquad \int_{C_1+C_2} \mathbf{A}(\bar{r}) \cdot \overline{d\ell} = 9$$

Express the **location** of point P_c using a **position vector**.