

### Special Problem 2-5.27

Contour  $C$  is a straight line extending from point  $P_a$  to point  $P_b$ .

Point  $P_a$  is located at  $\vec{r}_a = -\hat{a}_x - \hat{a}_y + 2\hat{a}_z$ .

Point  $P_b$  is located at  $\vec{r}_b = 2\hat{a}_x + 2\hat{a}_y + 2\hat{a}_z$ .

Note contour  $C$  intersects the  $z$ -axis, and is parallel to the  $x$ - $y$  plane!

Vector field  $\mathbf{A}(\vec{r}) = \frac{r^2 \cos \phi}{\sin \theta} \hat{a}_r$ .

Evaluate the contour integral  $\int_C \mathbf{A}(\vec{r}) \cdot d\vec{\ell}$

