

**THE JOHNS HOPKINS UNIVERSITY**  
**Faculty of Arts and Sciences**  
**7 Homework (part b) - FALL SESSION 2005**  
**110.211 - HONORS CALCULUS III.**

1. Compute

$$\int_C \frac{(y+z)dx + (z+x)dy + dz}{x^2 + y^2}$$

where  $C$  is the segment of the line between the points  $A = (1, 1, 1)$  and  $B = (2, 1, 2)$ .

2. Is

$$F(x, y) = \frac{x}{x^2 + y^2}\underline{i} + \frac{y}{x^2 + y^2}\underline{j}$$

a conservative vector field? Show or find a counterexample for the following identity

$$\int_C F ds = \int_{-C} F ds$$

where  $C$  is a simple, closed curve around  $(0, 0)$ .