Work integrals

1.   Let C be the path from (0,0) to (5,5) consisting of the straight line from (0,0) to $(5\sqrt{2}, 0)$ followed by the arc from $(5\sqrt{2}, 0)$ to (5,5) that is part of the circle of radius $5\sqrt{2}$ centered at the origin.

Compute $\displaystyle\int_C \mathbf{F} \cdot d\mathbf{r}$ for the following vector fields $\mathbf{F}$

a) $\mathbf{F} = x\,\mathbf{i} + y\,\mathbf{j}$;   b) $\mathbf{F} = x\,\mathbf{j}$.

(Remember to work smart and exploit geometry where possible.)

18.02SC Multivariable Calculus
Fall 2010