

$C$  appears to be a smooth curve, and since  $\nabla f$  is continuous, we know  $f$  is differentiable. Then the consequence of the Fundamental Theorem for line integrals says that the value of  $\int_C \nabla f \cdot d\mathbf{r}$  is simply the difference of the values of  $f$  at the terminal and initial points of  $C$ . From the graph, this is  $50 - 10 = 40$ .