Use What You Know in Rectangular Coordinates:

Next, use what you know about the path to find a expression for $d\vec{r}$ along the specific path 4 in the second figure below.

$d\vec{r} =$

This is the line element in rectangular coordinates along path 4.

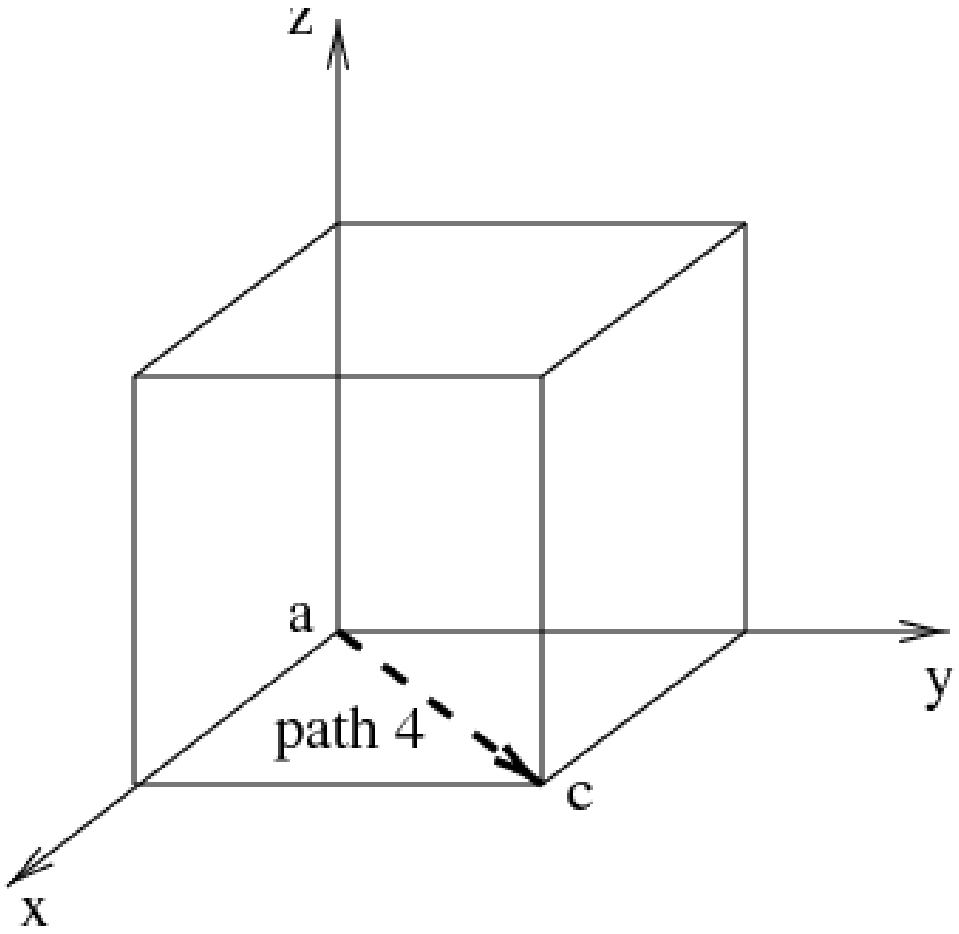

Figure 1: Figure 2: $d\vec{r}$ along path 4

Solution On path 4, $y = x$ and $z =$constant, which means $dy = dx$ and $dz = 0$. We can plug this information into the general expression for $d\vec{r}$ to obtain:

$$d\vec{r} = dx\,(\hat{x} + \hat{y}) = dy\,(\hat{x} + \hat{y})$$

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