

Provide a clear and organized presentation. Show all of your work, give exact values only, and completely simplify your answers. Given the vector valued function below,

evaluate $\int \bar{r}(t) dt$

$$\bar{r}(t) = \left\langle \frac{\sqrt{t-3}}{t+2\sqrt{t-3}}, \sin^2 t \cos^2 t, \frac{2t^4 + 16t^3 + 40t^2 + 47t + 22}{t^4 + 5t^3 + 10t^2 + 9t + 3} \right\rangle$$