

Please PRINT your name _____

No calculators, cell phones, computers, notes, etc.

Circle your answer. Make your work correct, complete and coherent.

The quiz is worth 5 points. The solutions will be posted on my website later today.

Quiz 11, Monday, October 26, 2020

Find the length of the curve $\vec{r}(t) = 4\cos t \vec{i} + 4\sin t \vec{j} + 3t \vec{k}$, for $0 \leq t \leq \pi/2$.

ANSWER: The arc length is

$$\begin{aligned} \int_0^{\pi/2} |\vec{r}'(t)| dt &= \int_0^{\pi/2} |-4\sin t \vec{i} + 4\cos t \vec{j} + 3 \vec{k}| dt \\ &= \int_0^{\pi/2} \sqrt{(16\sin^2 t + 16\cos^2 t + 9)} dt = \int_0^{\pi/2} \sqrt{(16+9)} dt = \int_0^{\pi/2} 5 dt = 5t \Big|_0^{\pi/2} = \boxed{\frac{5\pi}{2}}. \end{aligned}$$