$$\mathbf{r}(t) = \langle 8\cos t, 7t, 8\sin t \rangle \quad \Rightarrow \quad \mathbf{v}(t) = \mathbf{r}'(t) = \langle -8\sin t, 7, 8\cos t \rangle \ ,$$

$$\mathbf{a}(t) = \mathbf{v}'(t) = \langle -8\cos t, 0, -8\sin t \rangle \ , \quad |\mathbf{v}(t)| = \sqrt{64\sin^2 t + 49 + 64\cos^2 t} = \sqrt{113} \ .$$