Parametric equations for the curve are $x = t, \quad y = 0, \quad z = 6t - t^2$. Substituting into the equation of the paraboloid gives $6t - t^2 = t^2 \quad \Rightarrow \quad 6t = 2t^2 \quad \Rightarrow \quad t = 0, 3$. Since $\mathbf{r}(0) = \mathbf{0}$ and $\mathbf{r}(3) = 3\mathbf{i} + 9\mathbf{k}$, the points of intersection are $(0, 0, 0)$ and $(3, 0, 9)$.