

**Vector Functions and Curves**  
*One variable functions*

**Question**

Find the velocity, speed and acceleration of the particle with position given by  $\underline{r}(t)$  at time  $t$ . Also determine the particles path.

$$\underline{r} = t^2\underline{i} + \underline{k}$$

**Answer**

Position:  $\underline{r} = t^2\underline{i} + \underline{k}$

Velocity:  $\underline{v} = 2t\underline{i}$

Speed:  $v = 2|t|$

Acceleration:  $\underline{a} = 2\underline{i}$

Path: the line  $z = 1, y = 0$ .