

$$1. \vec{r}(t) = t^2 \vec{i} + 5t \vec{j} \quad (1, 5)$$

VELOCITY

$$\vec{v}(t) = \vec{r}'(t) = 2t \vec{i} + 5 \vec{j}$$

ACCEL.

$$\vec{a}(t) = \vec{r}''(t) = 2 \vec{i}$$

FIND t

$$t^2 = 1 \quad 5t = 5$$

$$t = \pm 1 \quad \frac{5t}{5} = \frac{5}{5}$$

$$t = \pm 1 \quad t = 1$$

AT  $t=1$

$$\vec{v}(1) = 2(1) \vec{i} + 5 \vec{j} = \boxed{2 \vec{i} + 5 \vec{j}}$$

$$\vec{a}(1) = 2 \vec{i}$$

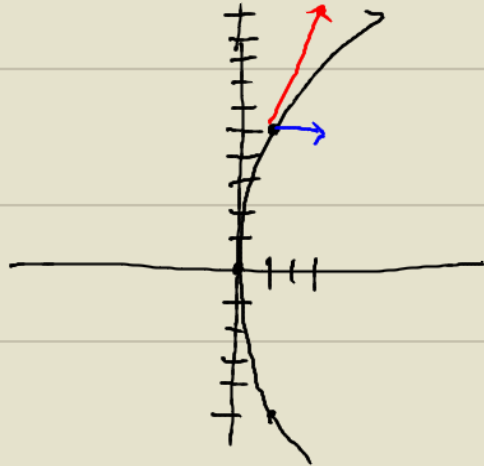
$$x = t^2 \quad y = 5t$$

$$\frac{y}{5} = t$$

PLUG INTO  $x = t^2$

$$x = \left(\frac{y}{5}\right)^2$$

$$x = \frac{y^2}{25}$$



$$2. \vec{r}(t) = t^2 \vec{i} + t^4 \vec{j} \quad (4, 16)$$

$$\vec{v}(t) = \vec{r}'(t) = 2t \vec{i} + 4t^3 \vec{j}$$

$$\vec{a}(t) = \vec{r}''(t) = 2 \vec{i} + 12t^2 \vec{j}$$

$$t^2 = 4 \quad t^4 = 16$$

$$t = \pm \sqrt{4} \quad t^{\frac{4}{1}} = 16$$

$$t = \pm 2 \quad \left[t^{\frac{4}{1}}\right]^{\frac{1}{4}} = \pm 16^{\frac{1}{4}}$$

$$t = \pm \sqrt[4]{16}$$

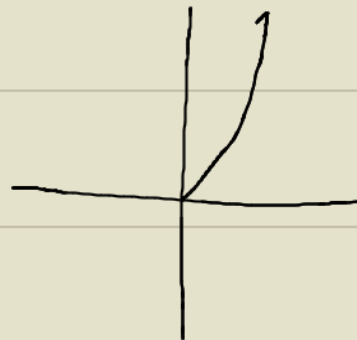
$$t = \pm 2$$

$$x = t^2 \quad y = t^4$$

$$y = t^2 \cdot t^2$$

$$y = x \cdot x$$

$$y = x^2$$



t=2

$$\vec{v}(2) = 2(2) \vec{i} + 4(2)^3 \vec{j} = \boxed{4 \vec{i} + 32 \vec{j}}$$

$$\vec{a}(2) = 2 \vec{i} + 12(2)^2 \vec{j} = \boxed{2 \vec{i} + 48 \vec{j}}$$