## Answer on Question #69217-Physics-Other

A particle moves along the curve  $y=ax^3$  such that x=Bt, and A and B are constant. Express the position vector of the particle in the lorm  $r(t) = xi^+ yj$ . Calculate the velocity of the particle along this path at any instant.

## Solution

$$x = Bt; y = Ax^3 = A(Bt)^3 = AB^3t^3.$$

The position vector of the particle is

$$\boldsymbol{r}(t) = (Bt)\hat{\iota} + (AB^3t^3)\hat{j}$$

The velocity of the particle along this path at any instant is

$$\boldsymbol{v}(t) = \frac{d}{dt}\boldsymbol{r}(t) = (B)\hat{\iota} + (3AB^3t^2)\hat{\jmath}$$

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