## Answer on Question \#69217-Physics-Other

A particle moves along the curve $y=a x^{\wedge} 3$ such that $x=B t$, and $A$ and $B$ are constant. Express the position vector of the particle in the lorm $r(t)=x i^{\wedge}+y j .{ }^{\wedge}$ Calculate the velocity of the particle along this path at any instant.

## Solution

$$
x=B t ; y=A x^{3}=A(B t)^{3}=A B^{3} t^{3}
$$

The position vector of the particle is

$$
\boldsymbol{r}(t)=(B t) \hat{\imath}+\left(A B^{3} t^{3}\right) \hat{\jmath}
$$

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

$$
\boldsymbol{v}(t)=\frac{d}{d t} \boldsymbol{r}(t)=(B) \hat{\imath}+\left(3 A B^{3} t^{2}\right) \hat{\jmath}
$$

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