

**Mathematics Questions by Topic**

Motion and Force

Answer 45

Source: K7SM2SQ16

**Question 45**

A particle travels in a straight line with velocity  $v$  at a time  $t$  and its displacement is  $x$ .  
If  $v^2 = 9x$  for  $x > 0$ , then the acceleration of the particle is given by

- A.  $\frac{2x}{3}$
- B. 4.5
- C.  $2\sqrt{x^3}$
- D.  $6x^2$
- E.  $\frac{3}{2\sqrt{x}}$

**ANSWER B**

$v^2 = 9x$  for  $x > 0$ ,  
differentiating implicitly with respect to  $x$ , gives

$$2v \frac{dv}{dx} = 9$$

$$\text{so that } a = v \frac{dv}{dx} = \frac{9}{2} = 4.5$$