

**Mathematics Questions by Topic**

Motion and Force

Answer 2

Source: K22SM2Q17

**Question 2**

A particle of mass  $m$  kg slides from rest down a smooth inclined plane, and travels a distance of  $S$  metres down the plane in a time of  $T_1$  seconds. Another particle of mass  $2m$  kg is placed on the same plane and travels a distance of  $2S$  metres down the plane in a time of  $T_2$ , seconds, then

- A.  $T_2 = 4T_1$
- B.  $T_2 = 2T_1$
- C.  $T_2 = T_1$
- D.  $T_2 = \frac{T_1}{2}$
- E.  $T_2 = \sqrt{2}T_1$

**ANSWER E**

$$ma = -mg \sin(\theta)$$

$$a = -g \sin(\theta), \quad u = 0$$

Note that when the mass is  $2m$  the acceleration down the plane is the same, using

$$s = ut + \frac{1}{2}at^2$$