**8** A ball of mass $m$ travels vertically downwards and then hits a horizontal floor at speed $u$.

It rebounds vertically upwards with speed $v$.

The collision lasts a time $\Delta t$.

What is the average resultant force exerted on the ball during the collision?

**A** $\frac{mv - mu}{\Delta t}$ downwards

**B** $\frac{mv - mu}{\Delta t}$ upwards

**C** $\frac{mv + mu}{\Delta t}$ downwards

**D** $\frac{mv + mu}{\Delta t}$ upwards

**9** The resultant force $F$ on a raindrop of mass $m$ falling vertically with velocity $v$ is given by the equation

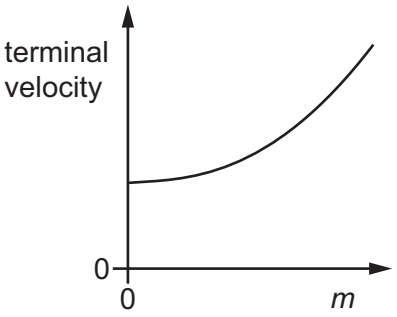
$$F = mg - kv^2$$

where $k$ is a constant and $g$ is the acceleration of free fall.

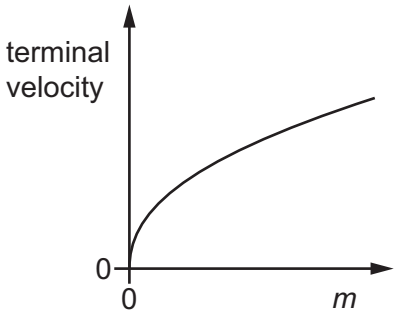
The falling raindrop eventually reaches a constant (terminal) velocity.

Which graph shows the variation of the terminal velocity of the raindrop with mass $m$?

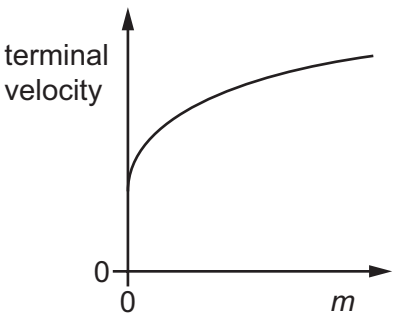
**A**




**B**




**C**




**D**