Motion & Force

A force of 120 N acts on a stationary body for 4 seconds and the body acquires a velocity of 36 ms-1. Calculate the mass of the body.

DATA :-

Force = 120 N

Initial Velocity = 0 ms-1

Final Velocity = 36 ms-1

Time taken = 4 secs

Mass = ?

SOLUTION :-

To find acceleration,

$v_f = v_i + at$

$a = \dfrac{v_f - v_i}{t}$

$a = \dfrac{36 - 0}{4}$

$a = \dfrac{36}{4}$

$a = 9 \, ms-2$

For Mass,

$F = ma$

$m = \dfrac{F}{a}$

$m = \dfrac{120}{9}$

$m = 13.3 \, kg$