Question#9865

A 3000 kg cannon fires a 10kg cannon ball the cannon recoils backwards at a speed of 5m/s how fast is the cannon ball traveling.

Solution:

Let:

$m1 = 3000kg - cannon\ mass,\ m2 = 10kg - cannon\ ball\ mass,\ v1 = 5m/s - cannon\ recoil\ backwards\ speed,$

$v2 - cannon\ ball\ speed = ?$

According with the law of **conservation of linear momentum**:

$m1 * v1 = m2 * v2;$

$v2 = \frac{m1*v1}{m2};$

$v2 = \frac{3000*5}{10} = 1500\ m/s$

Answer:

The cannon ball speed is: 1500 m/s.