Answer on Question 57765, Physics – Mechanics | Relativity

Question:

Car 1 is parked when it is hit by Car 2. The momentum of Car 2 before the collision was $50\ kgms^{-1}$. The momentum of Car 1 after the collision is $10\ kgms^{-1}$. What is the momentum of Car 2 after the collision?

Solution:

From the Law of Conservation of Momentum we have:

$$p_{Car\ 1(initial)} + p_{Car\ 2(initial)} = p_{Car\ 1(final)} + p_{Car\ 2(final)}.$$

From this formula we can find the momentum of Car 2 after the collision, $p_{Car\ 2(final)}$:

$$0\ kgms^{-1} + 50\ kgms^{-1} = 10\ kgms^{-1} + p_{Car\ 2(final)},$$

$$p_{Car\ 2(final)} = 50\ kgms^{-1} - 10\ kgms^{-1} = 40\ kgms^{-1}.$$

Answer:

The momentum of Car 2 after the collision is $p_{Car\ 2(final)} = 40\ kgms^{-1}$.