Question #84958, Physics / Other

A system consists of two cars. The first car is a 1220 kg car moving north at 5.80 m/s. The second car is 1180 kg and is moving 8.35 m/s south. What is the total momentum of the system?

Solution

$$\boldsymbol{p_1} = (1220)(5.80)\boldsymbol{j} = (7080\ Ns)\boldsymbol{j}$$

$$\boldsymbol{p_2} = -(1180)(8.35)\boldsymbol{j} = -(9850\ Ns)\boldsymbol{j}$$

The total momentum of the system:

$$\boldsymbol{p} = \boldsymbol{p_1} + \boldsymbol{p_2} = \left(7080\frac{kgm}{s}\right)\boldsymbol{j} - \left(9850\frac{kgm}{s}\right)\boldsymbol{j} = -(2770Ns)\boldsymbol{j}$$

Answer: 2.77 kNs south.