

**Answer on Question 50082, Physics, Mechanics — Kinematics — Dynamics** This question refers to: Laws of motion A rubber ball of mass 0.12 kg moving at a speed of 25 m/s perpendicular to a smooth vertical wall, rebounds from the wall without loss of speed in an impact lasting 0.004 s Calculate the impact force. Give your answer in Newtons Tip: consider the change of direction of the velocity before and after impact in your calculation. The answer could be a negative value.

Solution

Let us first find change of velocity of ball. It easy to understand that it will be

$$\Delta v = 25 + 25 = 50m/s$$

Now we can use formula for change of impulse

$$m\Delta v = F\Delta t$$

Hence, impact force is

$$F = \frac{m\Delta v}{\Delta t} = \frac{0.12 \cdot 50}{0.004} = 1.5 \cdot 10^3 N$$