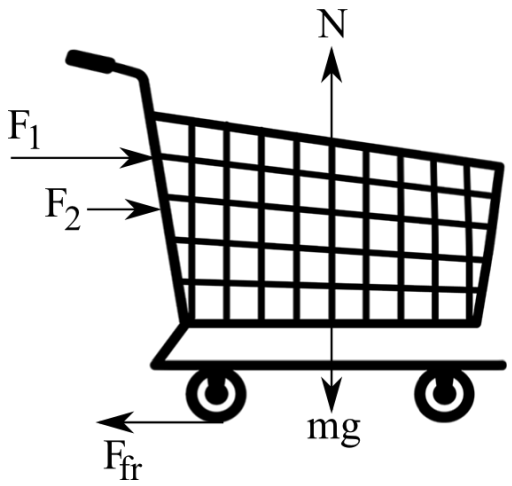
Answer on Question 63262, Physics, Mechanics, Relativity

Question:

A lady and a child pushing a shopping trolley. The lady pushes with a force of $40\ N$ and child with a force of $10\ N$. What is the horizontal force and name of forces acting on the trolley.

Solution:

Here's the sketch of our problem:



There are five forces that act on the shopping trolley: horizontal force $F_1 = 40\ N$ with which a lady pushing the shopping trolley, horizontal force $F_2 = 10\ N$ with which the child pushing the trolley, the force of gravity mg directed downward, the force of reaction N directed perpendicular to the surface and the friction force F_{fr} directed opposite to the horizontal force.

Since both forces F_1 and F_2 are parallel and act in the same direction, the resultant horizontal force applied to the trolley will be the sum of these two forces:

$$F_{res} = F_1 + F_2 = 40\ N + 10\ N = 50\ N.$$

Answer:

$F_{res} = 50\ N.$