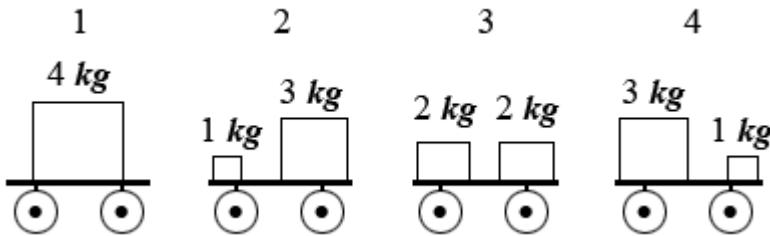


Answer on Question #62380-Physics-Other

See "Forces of the same magnitude directed to the right act on each of the carts for the same length of time."

I thought it meant that the carts might have been rolling to the right or positioned right. When they came to a stop "when the forces cease to act." I believed that they were asking, to what was the force in kg in which pushed the carts with velocity. Since the carts would have been moving right, it means that the last cart would have had a 2kg velocity push right. But that's not right at all.

Even though that's wrong I still don't understand why they say that all four carts have the same velocity, shouldn't it be they have all the same weight, and further more if the weight and velocity mean the same thing in this question, then would it matter at all if the question stated that "Forces of the same magnitude directed to the LEFT act on each of the carts for the same length of time.? Would it change anything at all.



Solution

The velocities are all the same. According to Newton's second law, $F = ma$, the acceleration a (determined by the equation $a = \frac{F}{m}$) depends only on the force F and the total mass m , so the distribution of mass on each cart has no effect. The total mass and the magnitude and direction of the force are the same for each cart, so the acceleration is the same. Finally, since the time over which the forces act is the same, the velocities (equal to the acceleration multiplied by the time) are also the same.

The direction of force can be right or left. It doesn't change the answer.

There are 4 situations, so the cars don't interact with each other.