

## Force Problems II

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1. Tony is pulling Fred, who is sitting in a wagon. Tony is pulling with a force of 250 N. Fred and the wagon have a combined mass of 75 kg. If there is also a frictional force of magnitude 100 N acting on Fred, what is Fred's acceleration?
2. Sasha is pushing Kara with a force 350 N. Kara has a mass of 50 kg. If Kara is accelerating with a rate of  $2 \text{ m/s}^2$ , what is the force of friction acting on Kara?
3. A car of mass 1500 kg is accelerating with a rate of  $3 \text{ m/s}^2$ . If the magnitude of the force of friction is 6000 N, how much force must the engine be producing?
4. A 250 kg crate is being pushed with a force of 1000 N. If the crate has an acceleration of  $1.5 \text{ m/s}^2$ , what is the force of friction on the crate?
5. A wooden block of mass 0.35 kg is accelerating at  $2.2 \text{ m/s}^2$  across a lab table because you are pulling it. There is 0.9 N of friction acting on the block. With how much force are you pulling the block?
6. Billy is pushing a 150 kg box to the right with a force of 300 N. Bobby is pulling the box to the right with a force of 400 N. If somehow there was no friction, what is the acceleration of the box?
7. Billy is pushing a 150 kg box to the right with a force of 300 N. Bobby is pulling the box to the right with a force of 400 N. If this time there was a friction force of 500 N acting on the box, what is the acceleration of the box?

Answers:      1)  $2 \text{ m/s}^2$       2)  $(-250 \text{ N})$       3)  $10,500 \text{ N}$       4)  $(-625 \text{ N})$       5)  $1.67 \text{ N}$   
6)  $4.67 \text{ m/s}^2$       7)  $1.33 \text{ m/s}^2$