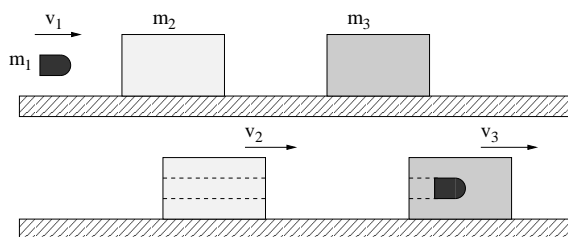


Univerza v Novi Gorici
 Fakulteta za aplikativno naravoslovje
 Inženirska fizika (I. stopnja)
 Fizika I
 2008/2009
 Ohranitev gibalne in vrtilne količine
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- Two titanium spheres approach each other head-on with the same speed and collide elastically. After the collision, one of the spheres, whose mass is 300 g, remains at rest. (a) What is the mass of the other sphere? (b) What is the speed of the two-sphere center of mass if the initial speed of each sphere was 2,0 m/s?
- A 3,5 g bullet is fired horizontally at two blocks resting on a smooth tabletop. The bullet passes through the first block, with mass 1,20 kg, and embeds itself in the second, with mass 1,80 kg. Speeds of $v_2 = 0,630 \text{ m/s}$ and $v_3 = 1,40 \text{ m/s}$, respectively, are thereby imparted to the blocks. Neglecting the mass removed from the first block by the bullet, find (a) the speed of the bullet immediately after it emerges from the first block and (b) the bullet's original speed.



- Two skaters, each of mass 50 kg, approach each other along parallel paths separated by 3,0 m. They have equal and opposite velocities of 1,4 m/s. The first skater carries one end of a long pole with negligible mass, and the second skater grabs the other end of it as she passes. Assume frictionless ice. (a) Describe quantitatively the motion of the skaters after they have become connected by the pole. (b) By pulling on the pole, the skaters reduce their separation to 1,0 m. What is their angular speed then? (c) Calculate the kinetic energy of the system in (a) and (b). (d) What is the source of the added kinetic energy?

