

A student is pushing a large crate across a rough floor. The student pushes so hard that the crate starts to accelerate across the floor. Which of the following is true:

- 1) Because of friction, the crate pushes harder on the student than the student pushes on the crate.
- 2) To overcome friction, the student pushes harder on the crate than the crate pushes on the student.
- 3) The crate pushes on the student with the same magnitude of force that the student pushes on the crate.
- 4) The answer depends on the acceleration and the friction.

8.01L Fall 2005

11/3/2005

What forces do you need to know to decide if a process can be understood with Work & Energy?

- 1) All forces that act on all of the objects in the problem.
- 2) All forces except the so-called 'internal' forces which act between objects.
- 3) All forces in the problem that have components along the motion of the objects they act on.
- 4) All forces in the problem that have components along the motion of the objects they act on except the so-called 'internal' forces which act between objects.
- 5) None of the above is true.

8.01L Fall 2005

11/3/2005

What forces do you need to know to decide if a process can be understood with Momentum?

- 1) All forces that act on all of the objects in the problem.
- 2) All forces except the so-called 'internal' forces which act between objects.
- 3) All forces in the problem that have components along the motion of the objects they act on.
- 4) All forces in the problem that have components along the motion of the objects they act on except the so-called 'internal' forces which act between objects.
- 5) None of the above is fully correct.

8.01L Fall 2005

11/3/2005

Two objects (labeled A & B) collide. Newton's 3rd law tells us that the force A exerts on B must be equal and opposite to the force B exerts on A. Which of the following is true:

- 1) The change in momentum of A due to the force between the objects must be equal and opposite of the change in momentum of B.
- 2) The work done on A by the force between the objects must be equal and opposite of the work done on B.
- 3) The change in kinetic energy of A due to the force between the objects must be equal and opposite of the change in kinetic energy of B.
- 4) (1) and (2) are true.
- 5) (2) and (3) are true.
- 6) (1) and (3) are true.
- 7) None of the above are true.
- 8) All of the above are true.

8.01L Fall 2005

11/3/2005