

HOMWORK - THIRD LAW IN DYNAMICS - DAY #4

Name: _____

Period: _____ Date: _____

Consider the following situation with cart A coasting across a frictionless table and striking the less massive cart B which is at rest.

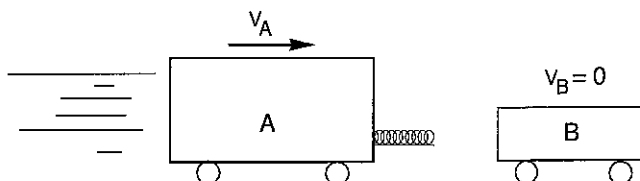


Figure 9.28

1.) Select the statement that most accurately describes the situation *before* the collision (in Figure 9.28).

- There is an external force acting *on* cart A, propelling it toward cart B.
- Cart A has an *internal* force propelling it toward cart B.
- There is both an internal force *in* cart A, and an external force *on* cart A propelling it toward cart B.
- There is neither an internal force *in* cart A nor an external force *on* cart A.

2.) What causes B to accelerate *during* the collision (shown above)?

- The force in A
- The force in B
- The force of A on B
- The force of momentum of B
- The force of inertia of A

Why are the others wrong?

3.) What causes B to keep moving *after* the collision (shown above)?

- | | |
|-------------------------------|--------------------------------|
| a.) The force in A | e.) The force of momentum of B |
| b.) The force in B | f.) The force of inertia of B |
| c.) The force given to B by A | g.) No cause is needed |
| d.) The force of A on B | |

Why are the others wrong?

4.) A 10 kg cart initially traveling 5m/sec collides with another 10 kg cart at rest on a frictionless surface. If the moving 10 kg cart slows to 1 m/sec what is the final speed of the stationary cart?

5.) Given a 20 kg cart moving 5 m/sec which collides with a 10 kg cart at rest, determine the final velocity of the 20 kg cart if the 10 kg cart speeds up to 4 m/sec.

6.) One 10 kg cart coasting towards the East at a speed of 2 m/s is hit from behind by another 10 kg cart going 6 m/s. Because there is a wad of bubble gum stuck to the back of the first cart the two carts stick together. How fast are the combined carts traveling?

7.) Fred throws a baseball to Sam.

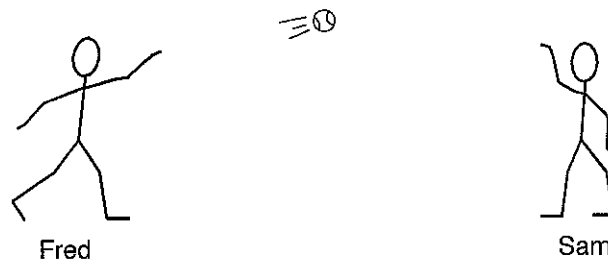


Figure 9.29

Draw a diagram (free body) showing all of the forces (neglect friction) acting on the ball when it is in the air half way from Fred to Sam. Label each force indicating what causes that force.