Sent: Sunday, October 12, 2003 7:15 PM

Question:
Re: Question 9-15 (not a homework question):
You told us that for an explosion in midair, like fireworks, the particles' center of mass kept moving in the normal parabolic path. But in this problem they treat it as if the fragment is launched again at the moment of explosion. Why? What difference does it make how many fragments are formed, or what mass they are? I thought they just fall in the original rocket's path.

Response:
My statement you quote about the picture I showed in lecture, "for an explosion in midair, like fireworks, the particles' center of mass kept moving in the normal parabolic path" is true (neglecting air resistance). That picture is one in which the rocket breaks up into many little pieces.

For this problem, the center of mass also continues along the parabola. The difference, of course, is that there are only two pieces and they give you the velocity (v=0) of one of those pieces. The center of mass of the SYSTEM (consisting of the two pieces) continues. This means that the other piece does not, of course, follow a parabola ... but you can calculate its path from the information given. (I think the picture is misleading, since it seems to imply that the other piece follows the initial parabola. Of course, it does NOT. The misleading picture is probably the reason I did not assign it.
