Additional PHY100 Practice

These are some practice questions. Since there are a number of pre-midterm questions already posted as practice from earlier in the course, many of the practice questions are post-midterm.

Try them yourself. Solutions will be posted in about a week.

1. A rocket is launched into space. As it rises, the exhaust gases are expelled downward, and the rocket moves upward. Explain how Newton's Three Laws are present throughout the entire motion of the rocket.

2. A satellite explodes in two in orbit, so half of the satellite is brought to rest (relative to the Earth). Explain what happens to the motion and momentum of the other half. Also explain in the context of Kepler's Law how the orbit of the second half will change compared to before it exploded. (Assume that neither half of the satellite leaves Earth's orbit).

3. Can a system have energy without having momentum? Explain. Can a system have momentum without having energy? Explain. Give examples or counter-examples of each.