Lunar Lander and Forces

Go to the following website:

http://phet.colorado.edu/new/simulations/index.php?cat=Motion. Once here, select the applet entitled Lunar Lander. Run the applet a couple of times to get familiar with it.

After you have utilized the applet, answer the following questions using complete sentences.

- 1. If you do nothing with the lander after the applet is started (you don't turn any thrust on), describe what happens:
- 2. What forces act on the lander *as* the lander falls IF YOU DO NOTHING. Draw a free-body diagram of the lander and use arrows to show all forces acting on the lander as it falls.
- 3. Using complete sentences, describe what you must do to land safely.
- 4. Now, rephrase your answer to #3 except this time discuss your answer in terms of the overall force on the lander and the lander's acceleration. Use "overall force" and "acceleration" in a meaningful way within your response.
- 5. Can you make the lander accelerate away from the moon? If so, what must you do?
- 6. Draw a free-body diagram showing the lander when it accelerates AWAY from the moon's surface. Indicate which of your forces is bigger, and explain how you know it is bigger.
- 7. Suppose you control the lander so that it drops to the surface of the moon at a constant velocity. Draw a free-body diagram of the forces acting on the lander. Explain which of your forces is largest and why.