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.