(1) How big an asteroid could you escape from by jumping?

Solution: Let R_a be that asteroid's radius, R_e the radius of the Earth. Assume the mean densities are equal. Then the escape velocities V_a and V_e are in the ratio of the radii, with $V_e^2 = 2gR_e$. This leads at once to the relation $R_a^2 = hR_e$, where h is the height you can jump on Earth, defined here as the distance your center of gravity rises *after* your feet leave the ground. Let's say $h = 50$ cm. Then $R_a = 1.7$ km. You can do a little better by running before jumping, as in the long jump. How much better? (Remember, you can't run faster than $V_a\sqrt{2}$ without losing contact!) It seems conservative to say that R_a will lie between 1.5 and 4 km.