Calculus Free Response: Position, velocity and acceleration NA

NAME\_\_\_\_\_

If an object on earth is dropped from 10,000 feet and falls in a vacuum, how long until it reaches the ground?

Suppose a skydiver jumps out of a plane at 10,000 feet and falls in a prone position. (Note: 1G is actually 32.2 feet per second per second, and we will use that number—wouldn't want to miscalculate a skydive!)

With air resistance, the maximum falling speed of the skydiver while prone is 122 mph. Calculate at what altitude the skydiver will reach 122 mph, and how long it takes to reach that speed.

At 1600 feet, the skydiver pulls a parachute cord. How many seconds has the skydiver been falling?

The parachute deploys while exerting a 1.5G deceleration force (it's a newer parachute, which is designed to be less harsh on the body). The parachute will slow the skydiver to 17 mph. At what altitude and overall time does the skydiver reach 17 mph?

How many seconds are there from the 10,000 foot jump until the skydiver lands?