

Problem 23

A skydiver weighing 180 lb (including equipment) falls vertically downward from an altitude of 5000 ft and opens the parachute after 10 s of free fall. Assume that the force of air resistance, which is directed opposite to the velocity, is of magnitude $0.75|v|$ when the parachute is closed and is of magnitude $12|v|$ when the parachute is open, where the velocity v is measured in ft/s.

- (a) Find the speed of the skydiver when the parachute opens.
- (b) Find the distance fallen before the parachute opens.
- (c) What is the limiting velocity v_L after the parachute opens?
- (d) Determine how long the sky diver is in the air after the parachute opens.
- (e) Plot the graph of velocity versus time from the beginning of the fall until the skydiver reaches the ground.