Name: _____

HW 2: Chapter 2

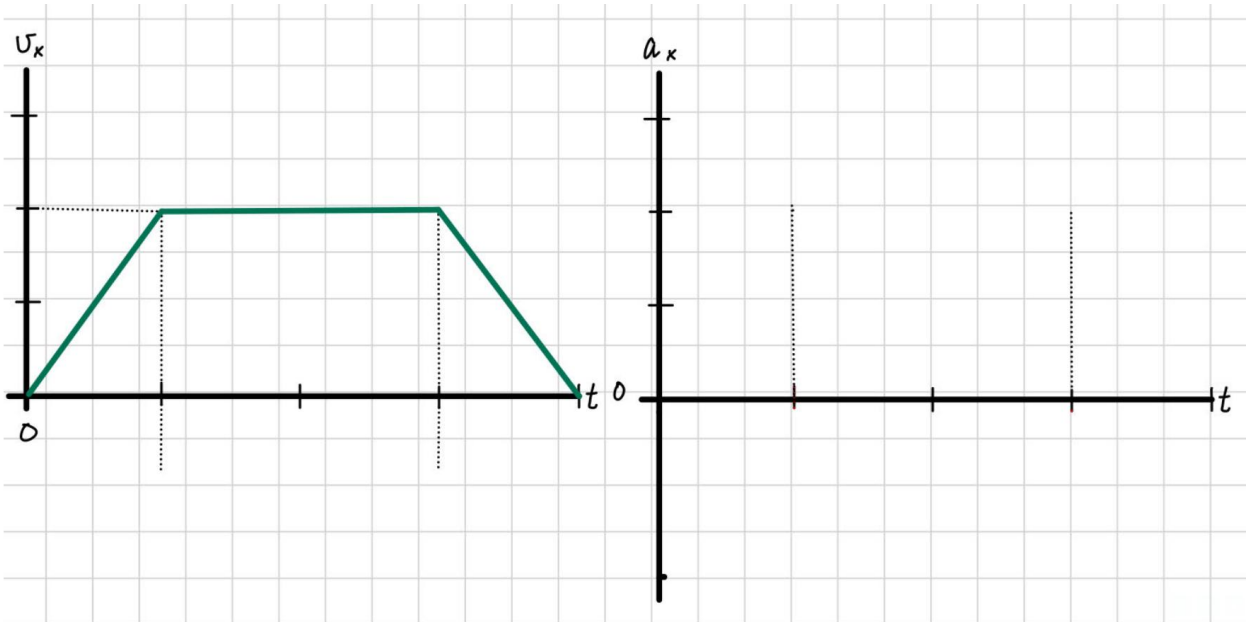
Physics 201

1. Finding the Braking Distance of a Car on the Highway

A car travels at a speed of 30 m/s on wet pavement. The driver sees an obstacle ahead and decides to stop. From this instant, it takes him 0.75 s to begin applying the brakes. Once the brakes are applied, the car experiences an acceleration of -6.0 m/s^2. How far does the car travel from the instant the driver notices the obstacle until it stops?

2. Analyzing a Velocity Versus Time Graph

Below is a velocity vs. time graph for a car. Using the same time scale, sketch the corresponding acceleration vs. time graph on the provided blank axes.



3. 1D Kinematics of a Rocket Ship on the Earth

A spaceship launches vertically from a platform 10 meters above the ground. It starts from rest and, after 1 s, reaches its maximum altitude with a velocity of 1000 m/s when its engines suddenly fail. The rocket then falls 1000 meters before deploying a parachute, which slows its descent as it floats gently back down to the launch pad with an upward acceleration of 5.0 m/s^2. Neglect air resistance (even though the parachute still works).

Questions:

1. What was the rocket's maximum altitude when the engines failed?
2. What was the rocket's acceleration during powered flight (while the engines were active)?
3. What does the deacceleration a_p need to be so that the rocket ship touches back down on the launch pad just as its velocity becomes 0.
4. What was the total descent time?