

Phys 201A

Quiz 3 - 10/20/09

Points: 10

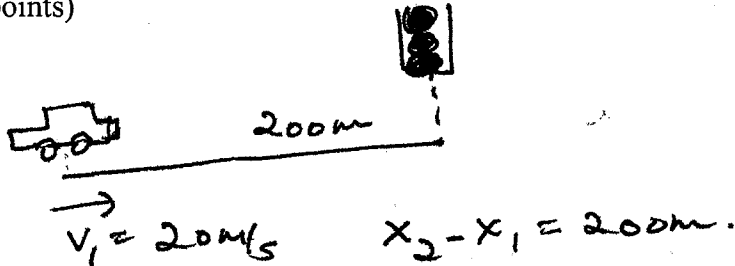
Name \_\_\_\_\_

- 1) Meera is driving at 20m/s when she sees that a traffic light 200m ahead has just turned red. She knows that this light turns red for 15s, and she wants to reach the light just as it turns green again. It takes her 1.0s to step on the brakes to begin slowing. What is her speed as she reaches the light at the instant it turns green?

(4 points)

- 2) Draw a position vs. time graph, a velocity vs. time graph and an acceleration vs. time graph to represent this motion. The graphs should indicate the appropriate times and distances.

(6 points)



1st phase: uniform speed; in one second the car travels 20m. So has to travel 180m.

$$x_2 - x_1 = v_1 t_2 + \frac{1}{2} a t_2^2$$

$$180 \text{ m} = \left( \frac{20 \text{ m}}{\text{s}} \right) (14 \text{ s}) + \frac{1}{2} a (14 \text{ s})^2$$

$$180 \text{ m} = 280 \text{ m} + \frac{1}{2} (196 \text{ s}^2) a$$

$$180 \text{ m} = 280 \text{ m} + (98 \text{ s}^2) a$$

$$a = \frac{-100 \text{ m}}{98 \text{ s}^2} = -1.02 \text{ m/s}^2$$

$$v_2 = v_1 + at$$

$$v_2 = \frac{20 \text{ m}}{\text{s}} - \left( 1.02 \frac{\text{m}}{\text{s}^2} \right) (14 \text{ s}) = 5.72 \text{ m/s}$$