

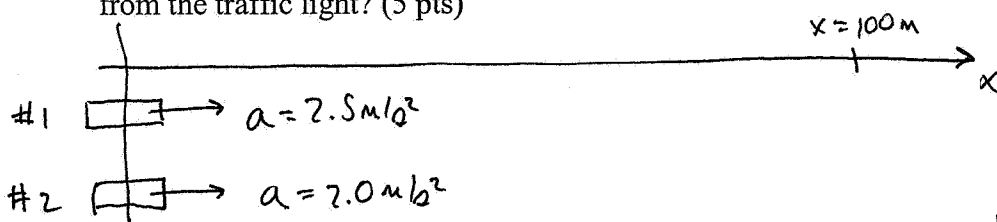
Name: KEY Recitation Instructor: _____

$$x = x_0 + v_0t + \frac{1}{2}at^2 \quad v = v_0 + at \quad v^2 = v_0^2 + 2a(x - x_0) \quad g = 9.8 \text{ m/s}^2$$

Multiple Choice: A bullet is dropped from rest into a river from a very high bridge. At the same time, another bullet is fired from a gun, straight down towards the water. Neglecting air resistance, the acceleration just before striking the water (circle one) (5 pts):

- a.) is greater for the dropped bullet
- b.) is greater for the fired bullet
- c.) is the same for each bullet**
- d.) depends on how high the bridge is
- e.) none of these.

Show all work: Two cars are stopped side-by-side at a traffic light. When the light turns green the first car accelerates with a constant acceleration of 2.5 m/s^2 and the second car accelerate with a constant acceleration of 2.0 m/s^2 . a) When the first car is 100 meters from the traffic light, what is the distance between the first car and the second car? (10pts) b) What is the speed of the first car when it is 100 meters from the traffic light? (5 pts)



a) car #1

Time to get to 100m

$$x = x_0 + v_0t + \frac{1}{2}at^2$$

$$100 = 0 + 0 + \left(\frac{1}{2}\right)(2.5)t^2$$

$$t = \sqrt{\frac{200}{2.5}} = 8.94 \text{ s}$$

$x_0 = 0$
 $x = 100 \text{ m}$
 $v_0 = 0$
 $v = ?$
 $a = 2.5 \text{ m/s}^2$
 $t = ?$

b) $v = v_0 + at$

$$= 0 + (2.5)(8.94)$$

$v = 22.4 \text{ m/s}$

Car #2 at time $t = 8.94 \text{ s}$

$$x = x_0 + v_0t + \frac{1}{2}at^2$$

$$x = 0 + 0 + \left(\frac{1}{2}\right)(2)(8.94)^2$$

$x = 80 \text{ m}$

So Distance is 20 m

$x_0 = 0$
 $x = ?$
 $v_0 = 0$
 $v = ?$
 $a = 2.0 \text{ m/s}^2$
 $t = 8.94 \text{ s}$

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