

PHYSICS

1 Dimensional Kinematics Problems

NAME _____

1. A certain automobile manufacturer claims that its super-deluxe sports car will accelerate uniformly from rest to a speed of 87 mi/h in 8 s .
 - a. Determine the acceleration of the car in ft/s^2 and mph/s
 - b. Find the distance the car travels in the first 8 s , (in feet).
 - c. What is the velocity of the car 10 s after it begins its motion, assuming it continues to accelerate at the rate of 16 ft/s^2 ?
2. Flossy Fletcher was curling her hair when she dropped the curling iron. The curling iron fell 1.651 m to the floor.
 - a. How fast was the iron traveling when it hit the floor?
 - b. How long was it in the air?
3. An electron in a cathode ray tube of a TV set enters a region where it accelerates uniformly from a speed of $(3 \times 10^4) \text{ m/s}$ to a speed of $(5 \times 10^6) \text{ m/s}$ in a distance of 2 cm .
 - b. How long is this electron in this region where it accelerates?
 - c. What is the acceleration of the electron in this region?
4. A long distance runner runs 3.1 miles in 18 minutes .
What is her average velocity in mi/hr ?
5. An F-15 jet fighter starts from rest and reaches a speed of 330 m/s in 2 seconds .
 - a. What is the planes acceleration?
 - b. How much distance did the jet cover in the 2 seconds ?
 - c. How fast was the jet traveling after 1 second ?
6. To calculate the depth of a well a physics student drops a rock into the well. 4.5 seconds after the rock is dropped the student sees it hit the bottom. The rock accelerates downwards at 9.80 m/s^2 .
 - a. How deep is the well?
 - b. How fast is the rock traveling the instant before it hits the bottom?
7. A bicyclist travels from 15.6 m/s to 21.1 m/s in 30 meters distance.
 - a. What is the acceleration of the bicyclist?
 - b. How much time does it take the bicyclist to travel the 30 meters ?
8. While looking out of a window in a building Hillary Clinton notices a republican falling past her window at 15 m/s . The republican falls with an acceleration of 9.80 .
 - a. How fast is the republican traveling after falling 30 m ?
 - b. How long does it take to travel 30 meters down?
 - c. The republican safely lands in some bushes an additional 15 meters farther down from the 30 m .
 - * What was his speed the instant before he hit the bushes?
 - * How long did it take to travel the total 45 meters down?