

Physics 20

UNIT 1- KINEMATICS

ASSIGNMENT 2 due: Monday September 15 P2

1. A motorbike accelerates uniformly from a velocity of 7.20 ms^{-1} [S] at a rate of 8.00 ms^{-2} [S]. What is the velocity of the motorbike if it accelerates for 2.50 s ?
2. An SUV uniformly accelerates from rest and reaches a velocity of 145 kmh^{-1} [W] in 14.7 s .
 - a. What is its acceleration in ms^{-2} ?
 - b. What is its average velocity in ms^{-1} ?
3. A runner travels 25.0 m [S] in 2.50 s while accelerating at a rate of 0.230 ms^{-2} [S]. What was the initial velocity of the runner?
4. A go-cart reaches its top velocity of 13.6 ms^{-1} [N] in 5.00 s when starting from rest.
 - a. What is its acceleration?
 - b. What was the displacement of the cart while it was accelerating?
5. A child hooks up so many cars to their toy train that it can't move. The child then removes the pin attaching the cars. With a reduction in the mass it is towing the train then accelerates at a rate of 0.500 ms^{-2} towards a chair leg 6.0 m away.
 - a. How long will it take to crash?
 - b. What is the average velocity of the ill-fated journey?
6. An oil tanker at "full steam" travels at 27 kmh^{-1} . When performing an emergency "crash stop" the tanker accelerates at -0.009 ms^{-2} . If the distance covered during the stop is 3 km how long does it take?
7. If a baseball is fired from ground height straight into the air and it takes 15.00 s to hit the ground what is its maximum height above the ground?

8. Boffo the clown is hilariously juggling a bowling ball, a chainsaw and a Chihuahua.

The release speed for the bowling ball is 8.00 ms^{-1} and the height is 1.30 m .

- a. What is the bowling balls zenith?
- b. How long does the ball take to reach this point?

Stinky Pete, a rival clown, distracts Boffo with a pie in the face just as the bowling ball reaches its zenith and it falls onto Boffo's foot. The children laugh and so does Boffo.

- c. What is the velocity of the ball as it strikes Boffo's foot?
- d. Why does Boffo laugh along with the children?
- e. Why does Stinky Pete hate Boffo?

9. An object is dropped on mystery planet X. In a 120.0-m fall the object has an average velocity of 30 m/s . What is the acceleration due to gravity on mystery planet X?

10. An egg hits the ground after 22 s . From what height does the egg drop?