# Physics 30S **Kinematics Worksheet**

**Kinematics**: Branch of Physics dealing with the description of motion from one point to another.

## Unit Conversions

multiply by 3600

divide by 3.6

km/h m/s hours seconds



## Formulas



## Questions

1. A vehicle travels +1000 m in 10 s. What is the velocity in km/h?
2. Your vehicle travels for 3 h at 50 km/h, then 2.5 h at 60 km/h. What is your average speed?
3. A vehicle accelerates uniformly from 10 m/s to 20 m/s in 15 s. What was the displacement of the vehicle for this interval?
4. What is the average velocity for a trip of +150 km which requires 2.25 h?
5. How far will an automobile go in 3.5 h at a constant speed of 95 km/h?
6. A delivery truck travels with a velocity of +85 km/h for 2 h, then with a velocity of

–40 km/h for 3 h. How far from its origin will it be at the end of the trip?

1. Two children cross a starting line at the same time, one running with a velocity of

+3.5 m/s and the other with a velocity of –4 m/s. How far apart are they after 12 s?

1. A dragster accelerates uniformly from rest to +56 m/s in 3.7 s. What is its acceleration?
2. A car has an acceleration of –2 m/s2. If it’s initial velocity is 24 m/s, to the east, what will its velocity be 8 s later?
3. An electric train initially moving at +25 km/h accelerates to +35 km/h in 20 s. Determine its average acceleration.
4. A motorist traveling at +90 km/h applies his brakes and comes to rest with uniform deceleration in 20 s. Calculate the average acceleration.
5. A train traveling at +100 km/h slows down with a uniform acceleration of -0.6 m/s2. How long does it take to stop?
6. A car traveling at +15 m/s accelerates at +8 m/s2 for 12 s. What distance does it travel in 12 s?
7. The driver of a Saturn traveling at +108 km/h applies the brakes to provide a deceleration of 2 m/s2. The car comes to rest in 225 m. How long did it take the car to come to rest?
8. Galileo is in a Boeing 747 moving at +10 m/s along the runway when the pilot causes it to accelerate at +4 m/s2. It requires 40 s to reach takeoff speed.  
   A) What is the takeoff speed?  
   B) What is the minimum length of runway required?
9. A jetliner, traveling northward, is landing with a speed of 250 km/h. Once the jet touches down, it has 750 m of runway in which to reduce its speed to 22 km/h. Calculate the acceleration during landing.
10. A truck, traveling at a velocity of 33 m/s due east, comes to a halt by decelerating at  
    11 m/s2. How far does the truck travel in the process of stopping?
11. A car starts from rest and moves with constant acceleration for 10 s. At the end of the 10 s time interval, the car has a velocity of +20 m/s.  
    a) What is the acceleration of the car?  
    b) How far did the car travel?
12. You are driving a car at a velocity of +90 km/h, when you suddenly see a dog step into the road 50 m ahead. You hit the brakes hard to get maximum deceleration of  
    7.5 m/s2. How far will you go before stopping? Can you avoid hitting the dog?
13. A cheetah can run short distances at top speeds of up to +31 m/s. How far would the cheetah travel in 3.2 s when running at top speed?