

Kinematics Worksheet

1. A car in front of the school goes 30.0 m in 2.35 seconds. What is its speed?
2. What speed must you average to go 280 km in 3.0 hours?
3. A car accelerates from rest to 27 m/s in 3.0 seconds. What is its acceleration?
4. A rocket accelerates at a rate of 190 m/s^2 for 2.4 seconds from rest. What is its final speed?
5. A car has a velocity of 15 m/s. It then accelerates at a rate of 3.5 m/s^2 for the next 5.0 seconds. What is its final velocity?
6. What distance will a train stop in if its initial velocity is 23 m/s and its acceleration is -0.25 m/s^2 ?
7. What distance will a car cover accelerating from 12 m/s to 26 m/s in 14 seconds?
8. A person starts at rest and accelerates at 3.2 m/s^2 for 3.0 seconds.
 - (a) What is their final velocity?
 - (b) What is their average velocity?
 - (c) What distance do they cover in that time?
9. A train traveling 12 m/s stops in a distance of 541 m. What was its acceleration?
10. A car skids to a halt at a rate of -9.4 m/s^2 . The skid marks measure 34 m. What speed was the car going when it slammed on the brakes?
11. A train can accelerate at a rate of 0.15 m/s^2 . In what distance will it obtain a speed of 25 m/s if it starts from rest?
12. A drag racer can reach a speed of 53 m/s over a distance of 120 m.
 - (a) What is the acceleration of the race car?
 - (b) Over what distance can it reach a speed of 85 m/s?
13. Light from the sun reaches Earth in 8.3 minutes. The velocity of light is $3.0 \times 10^8 \text{ m/s}$. How far is the Earth from the sun?
14. A car is moving down a street at 55 km/h. A child suddenly runs into the street. If it takes the driver 0.75 seconds to react and apply the brakes, how many meters will the car have moved before it begins to slow down?
15. Highway safety engineers build soft barriers so that cars hitting them will slow down at a safe rate. A person wearing a seatbelt can withstand an acceleration of $-3.0 \times 10^2 \text{ m/s}^2$. How thick should the safety barriers be to safely stop a car that hits a barrier at 110 km/h?