
Kinematics I**Practice**

- 1) A dog runs 100 m away from its master in a straight line in 8.4 s, and then runs halfway back in one-third the time. Calculate its average speed and average velocity.

- 2) Two locomotives approach each other on parallel tracks. Each has a speed of 120 km/h with respect to the earth. If they are initially 8.5 km apart, how long will it be before they meet.

- 3) A car decelerates from a speed of 25 m/s to rest in a distance of 120 m. What was its acceleration?

- 4) A ball player catches a ball 4.0 s after throwing it vertically upward. How high does it go and what was its initial velocity?

Assignment

- 5) At an average speed of 31.0 km/h, how far will a cyclist travel in 135 min?

- 6) If you are driving 100 km/h and you look to the side for 2.0 s, how far do you travel during this inattentive period?

- 7) A sports car is advertised to be able to stop, from a speed of 100km/h within 45 m. What is its acceleration in m/s?

- 8) A car travelling 90 km/h decelerates at a constant rate of 1.6 m/s^2 . Calculate:
- A. distance the car goes before it stops

 - B. the time it takes to stop
- 9) An applied force causes a 1500 kg car to accelerate at 1.2 m/s^2 . The car travels a distance of 80 m, reaching a final speed of 22 m/s. What was the initial speed of the car?
- 10) A car accelerates from 20 m/s to 35 m/s in 3.4 s. How far does it travel during this time?
- 11) An 1800 kg car initially travelling at 25 m/s brakes to avoid hitting another car. The car accelerates at -2.4 m/s^2 while braking to a stop. How far does the car travel during its acceleration?

Enrichment

- 12) An astronaut on the moon throws a 5.0 kg wrench vertically upwards with an initial speed of 10 m/s. The acceleration due to gravity on the surface of the moon is one-sixth that on the surface of the earth. What is the maximum height reached by the wrench?

13) A ball is thrown straight down with a speed of 50.0 m/s. What would be its' speed after 2 seconds?

14) An object moving with uniform acceleration changes its speed from 25 m/s to 45 m/s in 5.0s. What is the acceleration?

15) How long would it take a truck to uniformly accelerate from 10 m/s to 30 m/s over a distance of 80m?

Answers:

1) 4.5 m/s

2) 2.2 min

3) -2.6 m/s^2

4) 19.6 m, 19.6 m/s

5) 69.8 km

6) 56 m

7) -8.6 m/s^2 , 0.88 g's

8) 195 m, 16 s

9) 17 m/s

10) 94 m

11) 130 m

12) 31 m

13) 70 m/s

14) 4.0 m/s^2

15) 4 s