
Kinematics Problems 1

10. Sally travels by car from one city to another. She drives for 30 minutes at 80 km/h, 12 minutes at 105 km/h, and 45 minutes at 40 km/h, and she spends 15 minutes eating lunch and buying gas. (a) Determine the total distance she traveled. (b) What was her average speed for the whole trip?

(a) 91 km; (b) 53.5 km/h

16. A car traveling in a straight line has a velocity of 5 m/s. After an acceleration of 0.75 m/s/s, the car's velocity is 8 m/s. How long did the acceleration take?

4 s

20. A car traveling at 7 m/s accelerates at the rate of 0.8 m/s/s for 3 s. How fast is the car going after this acceleration?

9.4 m/s

18. A bus slows down uniformly from 21 m/s to 0 m/s in 21 seconds. How far does it travel before stopping?

220.5 m

19. A car accelerates uniformly from rest to a speed of 18 m/s in 12 s. Find the distance the car travels during this time.

108 m

D2. A race car with an initial speed of 4.3 m/s accelerates uniformly at 3 m/s/s for 5 s. (a) How fast is the car going after the acceleration? (b) How far does the car travel during this time?

(a) 19.3 m/s; (b) 59 m

22. A car starts from rest and travels for 5 s with a uniform acceleration of 1.5 m/s/s. The driver then applies the brakes for 3 s, causing a uniform acceleration of -2 m/s/s. (a) How far did the car travel in the first 5 s? (b) How fast was it going after the first 5 s? (c) How fast was the car going after braking for 3 s? (d) How far did the car travel during while braking for 3 s? (e) What was the total distance the car traveled in these 8 s?

(a) 18.75 m; (b) 7.5 m/s; (c) 1.5 m/s;

(d) 13.5 m; (e) 32.25 m

42. A speeder passes a parked police car at 30 m/s. The police car starts from rest with a uniform acceleration of 2.44 m/s/s. (a) How much time passes before the speeder is overtaken by the police car? (b) How far does the speeder get before being overtaken by the police car?

(a) 24.6 s; (b) 738 m

25. An elevator is moving upward at 1.2 m/s when it experiences an acceleration of -0.31 m/s/s (downward), for a distance of 0.75 m. (a) How long did the acceleration last? (b) How fast was the elevator going after the acceleration?

(a) 1.33 s; (b) 0.79 m/s