

Distance, Speed and Acceleration Extra Practice

1. A kid in your class is really bored one Saturday night and goes outside to study the nocturnal habits of mice in a hayfield. He sees a mouse sniffing along at 0.1 m/s but it hears him and starts to scurry for safety. In just 3.7 s it accelerates to 0.9 m/s . Find its acceleration.
2. A little grade nine kid moves down the hall at 1.2 m/s . When he sees a scary grade 12 kid coming, he begins to run. After 3.2 s , he is moving at 3.6 m/s . What is his acceleration?
3. Josh has a huge crush on Christina and thinks he can catch her. Josh is running at 3.0 m/s and accelerates at 1.5 m/s^2 for 13 s . What is his final velocity? Not to be caught by Josh, Christina is running at 2.0 m/s and accelerates at 2.5 m/s^2 for 10 s . What is her final velocity? At this speed, who will get what they want?
4. A car moving at 4.5 m/s accelerates at 2.5 m/s^2 . After 7 s , how fast will it be moving?
5. Some kid is out roaming the halls at 0.3 m/s . Seeing Mr. Atkinson come around the corner, he accelerates at 0.7 m/s^2 for 8 s . By then, how fast is he moving?
6. You decide to join the school ping pong team so you've been working on your serve. You can accelerate the ball at 4.6 m/s^2 . After how many seconds would it be traveling at 9.3 m/s ?
7. Looking for some good old-fashioned fun, you and some friends decide to slide down the hill by the staff entrance on a toboggan. Calculate the acceleration of the toboggan if it reaches a velocity of 32 m/s in 8 s .
8. You're getting some extra help after school one day and don't want to miss your bus. Running out the front doors at an impressive 18 m/s , you realize that the bus is pulling away and you won't make it. You slow down and stop in 4.5 s . Calculate your acceleration.
9. For Christmas break you and your family are taking a road trip to Montreal. Never wanting to miss a chance to practice science, you decide to keep track of your speed during the trip. Table 1 shows the data you collected.

Table 1: Data collected during trip to Montreal

Stage of trip	Initial odometer reading (km)	Final odometer reading (km)	Initial time (s)	Final time (s)
1	36252.1	36260.7	8:04	8:14
2	36260.7	36260.7	8:14	8:32
3	36260.7	36542.3	8:32	11:30
4	36542.3	36542.3	11:30	11:52
5	36542.3	36709.6	11:52	13:27

- a) During which time periods was the car moving? Calculate the speed during each of these separate time periods.
- b) Calculate the average speed for the trip as a whole, from the beginning of Stage 1 to the end of Stage 5.
- c) Explain the differences in your answers for (a) and (b).
- d) Draw a distance-time graph of the trip.