



## Mission to Mars

**Key formulas and conversions:** Speed = Distance  $\div$  Time

1 km = 1,000 m    1 hour = 3,600 seconds    1 mile  $\approx$  1.609 km    1 m/s = 3.6 km/h

### Part A: Converting Speeds

1. The Mars Rover moves across the Martian surface at 36 km/h. Convert this speed into meters per second.
2. A supply shuttle travels at 1,200 meters per second as it exits Earth's atmosphere. Express this speed in kilometers per hour.
3. A small reconnaissance drone flies at 45 miles per hour in the thin Martian air. Convert this speed to kilometers per hour.

### Part B: Converting Time and Distance

4. The command center receives a signal from Mars that takes 11 minutes and 20 seconds to reach Earth. How many seconds is this total time?
5. A probe travels 250,000 meters. Express this distance in kilometers.
6. An astronaut's rover moves at 0.5 meters per second for 2 hours. How far does it travel in meters and in kilometers?

### Part C: Mixed Conversion and Calculation

7. A spacecraft travels at 7,200 km/h for 15 minutes.
  - a) Convert 15 minutes into hours.
  - b) Calculate the total distance traveled in that time.
8. A landing craft descends through the atmosphere at a constant speed of 250 m/s.
  - a) Convert this speed to km/h.
  - b) If it continues for 5 minutes, how far does it fall (in kilometers)?
9. A satellite orbits Mars at a speed of 14,000 km/h. How long does it take to complete one orbit if the orbital path is 6,000 kilometers long? Give your answer in hours and minutes.

### Part D: Challenge - Interplanetary Journey

10. The mission spacecraft leaves Earth for Mars: The distance between the two planets is approximately 225 million kilometers. The spacecraft's average cruising speed is 90,000 km/h.
  - a) How long (in hours) will the journey take?
  - b) Convert that time to days.
  - c) If the spacecraft could double its speed halfway through, how many days would the second half of the trip take?