

2 Kinematics — Part 2 — Answers

Answers

2.1 (a) moving at constant velocity (steady speed in a straight line).

(b) at rest (not moving) — the displacement is not changing.

2.2 (a) $20 = \frac{1}{2}(9.8)t^2 \Rightarrow t = \sqrt{40/9.8} = 2.0 \text{ s.}$

(b) range = $8.0 \times 2.0 = 16 \text{ m.}$

2.3 $0.80 = \frac{1}{2}(9.8)t^2 \Rightarrow t = \sqrt{1.6/9.8} = 0.40 \text{ s.}$

2.4 $6.0t = 30 + 4.0t \Rightarrow 2.0t = 30 \Rightarrow t = 15 \text{ s.}$

2.5 Their vertical motion is the same: both start with zero vertical velocity and fall the same height under the same g . The horizontal speed is independent of the fall, so it does not change the time — they land together.