

Acceleration Practice Problems

You throw a rock off a cliff, giving it a velocity of 8.3 m/s, straight down. At the instant you released the rock, your hiking buddy started a stopwatch. You heard the splash when the rock hit the river below, exactly 6.9 s after you threw the rock. How high is the cliff above the river?

A car travels east along a straight road at a constant velocity of 18 m/s . After 5.0 s , it accelerates uniformly for 4.0 s . When it reaches a velocity of 24 m/s , the car proceeds with uniform motion for 6.0 s . Determine the car's total displacement during the trip.

PROBLEM TIP

When the type of motion of an object changes, the problem must be split into phases. Each phase is treated as a separate problem. The "final" conditions of one phase become the "initial" conditions of the next phase.

A truck is travelling at a constant velocity of 22 m/s north. The driver sees a traffic light turn from red to green soon enough, so he does not have to alter his speed. Meanwhile, a woman in a sports car is stopped at the red light. At the moment the light turns green and the truck passes her, she begins to accelerate at 4.8 m/s^2 . How far have both vehicles travelled when the sports car catches up with the truck? How long did it take for the sports car to catch up with the truck?