

## Chapter 2: Motion in one dimension

- Ex:1 If a car starts from rest and accelerates at  $8.00 \text{ m/s}^2$ . How much time elapses before its speed is  $30.0 \text{ m/s}$ ?
- Ex:2 A car moving at  $30.0 \text{ mph}$  stops in a distance of  $2.00 \text{ ft}$ . Calculate its acceleration.
- Ex:3 Mary runs  $100 \text{ m}$  in  $10.2 \text{ s}$ . If she starts from rest calculate the acceleration.
- Ex:4 A car's initial location is  $145 \text{ ft}$  from an intersection. Its initial velocity is  $60 \text{ mph}$  toward the intersection. The car slows at a rate of  $16.0 \text{ ft/s}^2$ . How long before the car reaches the intersection?
- Ex:5 A truck traveling at a constant  $45.0 \text{ mph}$  passes a stationary car just as the car starts forward with an acceleration of  $20.0 \text{ ft/s}^2$ . How far does the car travel before catching the truck?
- Ex:6 Calculate the time a rock takes to reach its maximum height if it is thrown up at  $65.8 \text{ ft/s}$ . What is this maximum height?
- Ex:7 While standing at the edge of a  $50.0 \text{ m}$  high cliff a child throws a rock straight up at  $15.0 \text{ m/s}$ . How fast is it going the instant before it hits the ground? Later the same child throws another rock straight down at  $15.0 \text{ m/s}$ . What speed does it have when it strikes the ground?
- Ex:8 At the NASA research center free-fall experiments are performed in a  $145 \text{ m}$  tall evacuated shaft. The experimental packages drop for  $5.18 \text{ s}$ . How far do the packages drop in this time? What acceleration is required to stop the packages in the remaining distance?
- Ex:9 A hot air balloon is rising at  $12.4 \text{ ft/s}$  when a camera falls over the side. How long does it take the camera to hit the ground if it starts falling when the balloon is  $36.2 \text{ ft}$  above the ground?
- Ex:10 A stunt person jumps off of a  $60.0 \text{ ft}$  high cliff and falls  $45.0 \text{ ft}$  and collides with an air bag. What acceleration does she experience while stopping if she stops in  $12.0 \text{ ft}$ ?
- Ex:11 A rocket accelerates upward at  $12.5 \text{ g's}$ . Its fuel runs out after  $2.75 \text{ s}$ . The rocket continues upward until it reaches its maximum height. Calculate the maximum height.