1. A plane leaves the airport and flies east at 109 miles/hour. 4.5 hour(s) later a second plane leaves east at 240 miles/hour. How long after taking off does the second plane overtake the first plane?
2. What is the tension on an elevator cable if the elevator (with a mass of 1209.3 kg) is traveling up at 4.2 m/s?
3. A ball thrown straight up with a velocity of 4.8 m/s. How long will it take to return to the thrower?
4. A ball is fired by a cannon from the top of a cliff as shown in the figure. Which of the paths would the cannon ball most closely follow?



|  |  |  |
| --- | --- | --- |
|  | a. 1  |  |
|  | b. 5  |  |
|  | c. 3  |  |
|  | d. 4  |  |
|  | e. There is no best selection to answer this question.  |  |
|  | f. 2  |  |

1. The graph below depicts the force of a hydraulic hammer pushing on a roller coaster on a straight and level track with no friction. What is the change in momentum of the roller coaster on during the first 6.5 seconds?

 

1. A large truck collides head-on with a small compact car. During the collision:

|  |  |  |
| --- | --- | --- |
|  | a. the truck exerts a force on the car but the car does not exert a force on the truck.  |  |
|  | b. the car exerts a greater amount of force on the truck than the truck exerts on the car.  |  |
|  | c. neither exerts a force on the other, the car gets smashed simply because it gets in the way of the truck.  |  |
|  | d. the truck exerts a greater amount of force on the car than the car exerts on the truck.  |  |
|  | e. the truck exerts the same amount of force on the car as the car exerts on the truck. |  |

1. Five students push a small car down the driveway. The momentum of the 1191.1 kg car is plotted as a function of time in the graph above and reaches 3000 kg m/s in 4 seconds. What is the average force of push by each student during the push?



1. A locomotive of mass 3532.8 is rigidly attached to a railroad car of mass 2487.3 riding without friction on a horizontal track. If the locomotive, which has a coefficient of static friction 0.6, exerts a force of 3933.1 N on the railroad car, what is the magnitude of the acceleration of the locomotive?
2. A bicycle accelerates from rest at 3.5 m/s2 for 1.6 seconds. What is the total distance traveled?
3. A jet flying at 206.0 km/hr travels between two cities in 1.5 hour(s). A turboprop flying the same route takes 5.5 hours. What is the speed of the turboprop?