Welcome back, Bill Wiecking

>>Working in AP Physics B (SC651)

Current Course
Course Home
Edit Course Info
Syllabus/Assignments
Grades
Student administration
Instructor administration

My Courses
AP Physics B
AP Physics C
Honors Physics
ePhysicsC
ePhysicsE

My Account
Change password
Manage courses

Homework Home
Logout

ch 2.8 to acc

acceleration

Chapter 2: Motion in One Dimension

Conceptual problems

2.C.12 (5.00) A penguin swimming through the icy Antarctic waters accelerates from 2.0 m/s to 4.0 m/s over a period of 4.0 seconds, then slows down to a stop over a period of 3.0 seconds and reverses direction, accelerating to 3.0 m/s in the opposite direction over a period of 4.0 seconds. Assume the penguin's acceleration was constant over each of the three time periods, and that it started out traveling in the positive direction. Draw the penguin's velocity versus time graph.

Submit answer on paper.

Section 11: Average acceleration

2.11.3 (5.00) A space shuttle sits on the launch pad for 2.0 minutes, and then goes from rest to 4600 m/s in 8.0 minutes. Treat its motion as straight-line motion. What is the average acceleration of the shuttle (a) during the first 2.0 minutes, (b) during the 8.0 minutes the shuttle moves, and (c) during the entire 10 minute period?

(a) _____ m/s^2

(b) _____ m/s^2

(c) _____ m/s^2

2.11.7 (7.00) A particle's initial velocity is v. Every second, its velocity doubles. Which of the following expressions would you use to calculate its average acceleration after five seconds of motion?

○ $32v/5$ ○ $2v$ ○ $31v$ ○ $31v/5$

Section 18: Motion equations for constant acceleration

2.18.1 The United States and South Korean soccer teams are playing in the first

(5.00) round of the World Cup. An American kicks the ball, giving it an initial velocity of *v* m/s. The ball rolls a distance of 5.0 m and is then intercepted by a South Korean player. If the ball accelerates at −0.50 m/s^2 while rolling along the grass, find its velocity at the time of interception.

m/s

2.18.6 **(7.00)** Two spacecraft are 13,500 m apart and moving directly toward each other. The first spacecraft has velocity 525 m/s and accelerates at a constant −15.5 m/s^2. They want to dock, which means they have to arrive at the same position at the same time with zero velocity. (a) What should the initial velocity of the second spacecraft be? (b) What should be its constant acceleration?

(a) m/s

(b) m/s^2

2.18.7 **(10.00)** A Honda® and a Porsche® race, starting from the same point. The Honda accelerates at a constant 4.00 m/s^2; the Porsche at a constant 8.00 m/s^2. The Porsche gives the Honda an advantage by letting it start first. The Honda accelerates, and when it is traveling at 23.0 m/s, the Porsche starts. How far do the cars travel from the starting point before the Porsche catches up with the Honda?

m

Section 23: Free-fall acceleration

2.23.2 **(5.00)** A watermelon cannon fires a watermelon vertically up into the air at a velocity of +*v* m/s, starting from an initial position 1.20 meters above the ground. When the watermelon reaches the peak of its flight, what is (a) its velocity, (b) its acceleration, (c) the elapsed time, and (d) its height above the ground?

(a) m/s

(b) m/s^2

(c) s

(d) m

2.23.10 **(7.00)** Two rocks are thrown off the edge of a cliff that is 15.0 m above the ground. The first rock is thrown upward, at a velocity of +12.0 m/s. The second is thrown downward, at a velocity of −12.0 m/s. Ignore air resistance. Determine (a) how long it takes the first rock to hit the ground and (b) at what velocity it hits. Determine (c) how long it takes the second rock to hit the ground and (b) at what velocity it hits.

(a) s

(b) m/s

(c) s

(d) m/s

Section 29: Interactive problem: shuffleboard

2.29.2 **(5.00)** Use the information given for the second interactive problem in Section 2.29 to answer the following questions. (a) Using an initial velocity of 2.00 m/s, what is the acceleration of the puck? (b) What is the initial velocity required to stop the puck at the goal line? Test your answer using the simulation.

(a) m/s^2

(b) m/s

Additional problems

2.A.7 **(10.00)** Lucy is using a programmable treadmill. She inputs a top speed into the treadmill and presses "start." The treadmill accelerates from rest at 0.100 m/s^2 until it reaches that speed, after which it stays at that constant speed. Later, when she is getting tired, she hits the "stop" button and the treadmill slows down at a rate of 0.200 m/s^2 until it comes to a stop. The treadmill tells her that she traveled the equivalent of 3.00 kilometers in 15.0 minutes while the treadmill was in motion. (a) If Lucy had been running forward in a straight line on the ground (instead of in place on the treadmill), what would be her average velocity in meters per second over the whole 15.0 minutes? (b) What would be her average acceleration over the 15.0 minutes? (c) What was the top speed of the treadmill? (d) How long after pressing "start" did she press "stop?"

(a) m/s

(b) m/s^2

(c) m/s

(d) s

Back to assignments list

Current server time is: 2008-02-17 16:23