# Seating for PHYS 1020 Midterm Thursday, October 22 7 - 9 pm

## Seating is by last name

Room	From	То
111 Armes	A	BJ
200 Armes	BL	GA
201 Armes	GH	KH
204 Armes	KI	ОВ
205 Armes	ОК	SA
208 Armes	SC	Z

20 multiple choice questions, ch 1-5. Formula sheet provided.

Wednesday, October 21, 2009

### WileyPLUS assignment 2: Chapter 5, Problem 12

The earth rotates once per day about an axis passing through the north and south poles, an axis that is perpendicular to the plane of the equator. Assuming the earth is a sphere with a radius of  $6.38 \times 10^6$  m, determine the centripetal acceleration of a person situated (a) at the equator and (b) at a latitude of 45.0 ° north of the equator.



Q6, Dec 2006 Final: Two cars approach each other on a straight level road. Car A is travelling at 75 km/h north and car B is travelling south at 45 km/h. What is the velocity of car A relative to car B?

Wednesday, October 21, 2009

#### 2008 Midterm: Q7

A ball is thrown horizontally from the top of a 20-m-high hill. It strikes the ground at an angle of 45°. With what speed was it thrown?



#### 2008 Midterm: Q 5

A golfer rides in a golf cart at an average speed of 3.1 m/s for 28 s. She then gets out of the cart and starts walking at an average speed of 1.3 m/s.

For how long must she walk if her average speed for the entire trip, riding and walking, is 1.8 m/s?

a) 72.8 s b) 174 s c) 1.00 s d) 100.8 s e) 56.3 s

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#### 2006 Midterm: Q 4

4. A boat pilot must cross a river that is 200 m wide and arrive at the dock that is 100 m downstream. To do so, he must steer the boat at an angle of 10° upstream. The boat's speed in the water (at rest) is 3.0 m/s. What is the speed of the current in the river?

(a) 2.0 m/s (b) 3.5 m/s (c) 1.6 m/s

(d) 2.8 m/s (e) 3.0 m/s



#### 2007 Midterm: Q 11

- A man at point A directs his rowboat due north toward point B, straight across a river of width 100 m. The river current is due east. The man starts across, rowing steadily at 0.75 m/s and reaches the other side of the river at point C, 150 m downstream from his starting point. While the man is crossing the river, what is his velocity relative to the shore?
  - (a) 1.35 m/s,  $34^{\circ}$  north of east (b) 2.00 m/s,  $56^{\circ}$  north of east (c) 1.74 m/s,  $34^{\circ}$  north of east (d) 2.11 m/s,  $34^{\circ}$  north of east (e) 2.50 m/s,  $42^{\circ}$  north of east



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#### 2005 Midterm: Q 15

The orbital radius about the Sun of Saturn is about 10 times that of Earth. The period of Saturn is about:

- a) 6 y
- b) 30 y
- c) 40 y
- d) 90 y
- e) 160 y

#### Problem 4:51

The drawing shows a 25.0-kg crate that is initially at rest. Note that the view is one looking down on the top of the crate. Two forces,  $F_1$  and  $F_2$ , are applied to the crate, and it begins to move. The coefficient of kinetic friction between the crate and the floor is  $\mu_k = 0.350$ . Determine the magnitude and direction (relative to the x axis) of the acceleration of the crate.



1.65 m/s<sup>2</sup>, 34.6° above the x axis

Top view

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#### 🖞 2008 Midterm: Q 19

- 19. A 25-kg box is sliding down an ice-covered hill. When it reaches point A, the box is moving at 11 m/s. Point A is at the bottom of a circular arc that has a radius R = 7.5 m. What is the magnitude of the normal force on the box at Point A?
  - (a) 250 N
  - (b) 650 N
  - (c) 280 N
  - (d) 900 N
  - (e) 400 N



#### Problem 4:59

A 1.40-kg bottle of vintage wine is lying horizontally in a rack, as shown in the drawing. The two surfaces on which the bottle rests are 90.0° apart, and the right surface makes an angle of 45.0° with respect to the horizontal. Each surface exerts a force on the bottle that is perpendicular to the surface. Both forces have the same magnitude F. Find the value of F.

9.70 N



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#### 2007 Midterm: Q 8

A tennis ball is thrown from ground level with velocity  $v_0$  directed 30° above the horizontal. If it takes the ball 1.0 s to reach the top of its trajectory, what is the magnitude of the initial velocity?

(a) 4.9 m/s (b) 9.8 m/s (c) 11.3 m/s (d) 19.6 m/s (e) 34.4 m/s

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#### 2008 Midterm: Q 20

A 2400-kg satellite is in a circular orbit around a planet. The satellite travels with a constant speed of  $6.67 \times 10^3$  m/s. The radius of the circular orbit is  $8.92 \times 10^6$  m. Determine the magnitude of the gravitational force exerted on the satellite by the planet.

- (a)  $1.2 \times 10^4$  N
- (b)  $7.5 \times 10^{-4}$  N
- (c)  $2.4 \times 10^4$  N
- (d)  $5.0 \times 10^{-3}$  N
- (e) This cannot be determined since the mass and radius of the planet are not specified.



