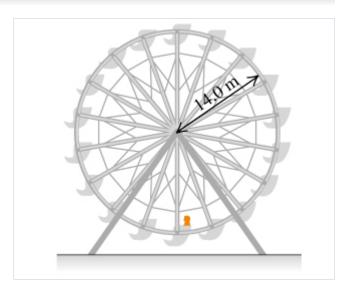
#### #9 Circular Motion Post-class

Due: 11:00am on Wednesday, September 12, 2012

Note: You will receive no credit for late submissions. To learn more, read your instructor's Grading Policy

### Exercise 3.34

The Ferris wheel in the figure , which rotates counterclockwise, is just starting up. At a given instant, a passenger on the rim of the wheel and passing through the lowest point of his circular motion is moving at 3.00  $\rm m/s$  and is gaining speed at a rate of 0.500  $\rm m/s^2$ .



#### Part A

Find the magnitude of the passenger's acceleration at this instant.

ANSWER:

$$a = 0.814 \text{ m/s}^2$$

Correct

#### Part B

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Find the direction of the passenger's acceleration at this instant.

ANSWER:

$$\theta$$
 = 37.9 ° to the right of vertical

**Correct** 

## Exercise 3.29

The earth has a radius of 6380 km and turns around once on its axis in 24 h.

#### Part A

What is the radial acceleration of an object at the earth's equator? Give your answer in  $m/s^2$ .

ANSWER:

$$a_{\rm rad} = 3.40 \times 10^{-2} \text{ m/s}^2$$

Correct

#### Part B

What is the radial acceleration of an object at the earth's equator? Give your answer as a fraction of q.

ANSWER:

$$a_{\rm rad} = 3.40 \times 10^{-3} g$$

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Correct		

#### Part C

If  $a_{\rm rad}$  at the equator is greater than g, objects would fly off the earth's surface and into space. What would the period of the earth's rotation have to be for this to occur?

ANSWER:

$$T = 5070 \text{ s}$$

# Exercise 3.31

In a test of a " $\it q$  -suit," a volunteer is rotated in a horizontal circle of radius 7.2 $\it m$  .

#### Part A

What must the period of rotation be so that the centripetal acceleration has a magnitude of 2.0g?

Express your answer using two significant figures.

ANSWER:

$$T_1 = 3.8 \text{ s}$$

Correct		

#### Part B

What must the period of rotation be so that the centripetal acceleration has a magnitude of 12g?

Express your answer using two significant figures.

ANSWER:

$$T_2 = 1.6 \text{ s}$$

## Score Summary:

Your score on this assignment is 98.2%. You received 29.45 out of a possible total of 30 points.

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