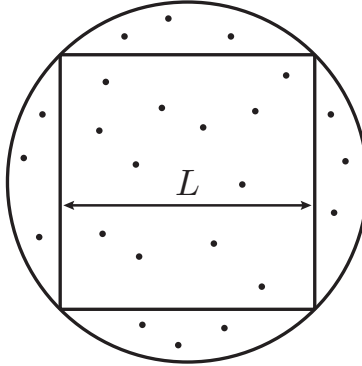


Physics 234: Quiz 8

Monday, March 28, 2011

Student's Name: _____

1. A box of linear size L is inscribed in a circle, as shown below:



Suppose we generate many random, uniformly distributed coordinate positions (x, y) . The fraction of points that lies within the box we denote f_b and the fraction that lies within the circle f_c . The ratio f_b/f_c is a Monte Carlo estimate of the what quantity?

- (a) π
 - (b) $\pi/2$
 - (c) $2/\pi$
 - (d) $L/\sqrt{2}$
 - (e) πL^2
2. Let N be the (large) number of randomly generated points enclosed by the circle. How does the *relative error* of the estimate in question 1 scale?
- (a) N
 - (b) \sqrt{N}
 - (c) $N^{-1/2}$
 - (d) $1/N$
 - (e) $N \log N$
3. Numerical errors that arise from the floating-point representation are of minor importance in a Monte Carlo calculation.
- (a) true
 - (b) false