

Quiz 6 will cover the following material: (all handouts posted on the web site so far)

1. All material for Quizzes 1-4 and Exam 1
2. Numerical Integration: compute the Riemann sum of a function over a given interval: Left sum, right sum, trapezoidal approximation, and using Simpson's Rule.
3. Computing volumes using cross sections.

## Sample Quiz 6

1. a) Compute the trapezoidal approximation for  $\int_1^2 e^{(1/x)} dx$  using a uniform partition with  $n = 6$ . Present an approximate value for the answer, accurate up to four or more decimals.  
b) Use Simpson's Rule to approximate the same integral.
2. Compute the volume of the solid with a circular base with radius  $r$  if cross sections perpendicular to the base are
  - a) isosceles right triangles with the hypotenuse lying on the base.
  - b) isosceles right triangles with the shorter side on the base.
3. A pyramid has height  $H$  and a base that is a rectangle with sides  $a$  and  $b$ . Set up an integral expressing the volume of this pyramid and evaluate it.

## Answers

1. a)  $\frac{1}{12} (e + 2e^{6/7} + 2e^{6/8} + 2e^{6/9} + 2e^{6/10} + 2e^{6/11} + e^{6/12}) \approx 2.0253609$   
b)  $\frac{1}{18} (e + 4e^{6/7} + 2e^{6/8} + 4e^{6/9} + 2e^{6/10} + 4e^{6/11} + e^{6/12}) \approx 2.02019003$
2. a)  $\frac{4}{3}r^3$       b)  $\frac{8}{3}r^3$
3.  $V = \int_0^H \left(a \frac{x}{H}\right) \left(b \frac{x}{H}\right) dx = \frac{1}{3}Hab$