

**MAT 162-003 and MAT 162-300**  
**Main Topics for Test 2**  
**Monday, Feb. 20, 2012**

(Sections 7.7, 7.8, 8.1, 8.2, 8.3, 10.1, 10.2)

**Approximate Integration**

Be able to:

- use the Midpoint Rule, the Trapezoidal Rule, and Simpson's Rule by hand for small values of  $n$
- use the Midpoint Rule, the Trapezoidal Rule, and Simpson's Rule given a table of data

**Improper Integrals**

Be able to:

- evaluate improper integrals (which may sometimes require the use of L'Hospital's Rule to calculate limits)
- use the p-Test and the Comparison Test to determine if an improper integral converges or diverges, and write your reasoning in sentence form

**Other Applications of Integration**

Be able to set up an integral by hand (and evaluate it by hand when possible) for problems on:

- arc length
- surface area of revolution
- finding center of mass (centroids) of regions
- force exerted by a liquid on a vertical plate (hydrostatic force)

**Parametric Equations**

Be able to :

- graph curves defined by parametric equations by eliminating the parameter
- find the slope at a point on a parametric curve, and the equation of the tangent line at a given point
- find the second derivative at a point on a parametric curve

Be able to set up an integral by hand (and evaluate it by hand when possible) to:

- find the area under a portion of a parametric curve
- find the arc length of a portion of a parametric curve
- find the surface area of revolution of a parametric curve