

Topics for Calculus BC Test on Chapter 8

1) Indeterminate forms and knowing how to apply L'Hopital's Rule

a) $\frac{\infty}{\infty}, \frac{0}{0}, \infty - \infty, 1^\infty, 0^0$, and ∞^0

b) Transforming indeterminate forms into rational expressions to apply L'Hopital's

Rule: $\lim_{x \rightarrow a} \frac{f(x)}{g(x)} = \lim_{x \rightarrow a} \frac{f'(x)}{g'(x)}$ or $\lim_{x \rightarrow \pm\infty} \frac{f(x)}{g(x)} = \lim_{x \rightarrow \pm\infty} \frac{f'(x)}{g'(x)}$

2) Improper Integrals

- Remember earlier techniques of integration including separation of variables.
- Know where to use the dummy variable

3) Integration by Partial Fractions and/or Trig substitutions.

c. Know when to use a linear term in the numerator

$$\frac{A}{x+d} + \frac{Bx+C}{ax^2+bx+c} \text{ where } ax^2+bx+c \text{ is a factored quadratic.}$$

d. Know when to use more than one term for a perfect square, cube, etc.

$$\frac{A}{x} + \frac{B}{x^2}, \text{ etc.}$$

e. Know the proper trig substitutions:

$$a^2 + x^2 \Rightarrow x = a \tan \theta$$

$$a^2 - x^2 \Rightarrow x = a \sin \theta$$

$$x^2 - a^2 \Rightarrow x = a \sec \theta$$

A cheat sheet is allowed for this chapter test. The sheet can be 8 ½ by 6 ½ front and back. It must have your name on it, be in your handwriting only and is to be turned in with the test. Calculators are allowed but if you are instructed to solve a problem analytically, your calculator should not be used and your work must be shown.