## FLOW CHART FOR EVALUATING AN INTEGRAL WITH UPPER & LOWER LIMITS OF INTEGRATION (PRE-CHAPTER 7)

You must execute the flow chart in this precise order. If you do not, the results may be incorrect. NOTE that finding antiderivatives is the LAST choice of action.

## **CRITERION**

- 1. Does the function have a discontinuity at any point in the interval ?
- 2. Are the limits opposites ?
  - a. Is the integrand odd ?
  - b. Is the integrand a sum of terms (or can it be written as a sum of terms), some of which are odd ?
- 3. Do any terms of the integrand correspond to a line, or a quarter- or half-circle over the interval ?

## 4.

## **IF ANSWER IS "YES"**

Identify location of discontinuity and and specify that FTC2 cannot be used to evaluate the integral

The integral is 0

Write the integral as the sum of an integral of the odd terms and an integral of the remaining terms; apply 2a to the first integral and evaluate the second integral using the steps below

Write the integral as the sum of an integral of those linear/circle terms and an integral of the remaining terms;

use formulae for areas of rectangles, triangles, trapezoids, quarter- or half-circles to evaluate the first integral and evaluate the second integral using the steps below

Evaluate all remaining integrals using FTC Part 2 (ie. find the antiderivative of the integrand, substitute the limits of integration and find the difference)