

**CALCULUS JOURNAL**  
**INTEGRATION**

1. Two names for the process of reversing a derivative are \_\_\_\_\_  
and \_\_\_\_\_
2. What must be included in the solution of all indefinite integrals? \_\_\_\_\_
3. For each type of integration problem, describe what part of the function should be substituted.
  - a) quantity to a power \_\_\_\_\_
  - b) trig function to a power \_\_\_\_\_
  - c) trig function with an argument \_\_\_\_\_
  - d) trig function to a power with an argument \_\_\_\_\_
  - e) natural log of a quantity \_\_\_\_\_
  - f) 1 over a quantity \_\_\_\_\_
  - g)  $e$  to a quantity power \_\_\_\_\_
4. When you substitute for a variable and not all of the original variables cancel out, you should eliminate the remaining variables by \_\_\_\_\_  
\_\_\_\_\_.
5. List the 3 steps for integrating a function which results in an inverse trig function.
  1. \_\_\_\_\_
  2. \_\_\_\_\_
  3. \_\_\_\_\_
6. A definite integral results in \_\_\_\_\_  
while an indefinite integral results in \_\_\_\_\_.
7. In terms of a graph, a definite integral represents \_\_\_\_\_  
\_\_\_\_\_.
8. (a) What should be done if the limits of integration are reversed such as  $\int_8^3 f(x) dx$ ? \_\_\_\_\_  
\_\_\_\_\_.
- (b) What can be done with a constant coefficient on a function such as  $\int_a^b c \cdot f(x) dx$ ? \_\_\_\_\_.
9. (a) What will result from  $\frac{d}{dx} \int_a^x f(t) dt$ ? \_\_\_\_\_
- (b) What will result from  $\frac{d}{dx} \int_a^{g(x)} f(t) dt$ ? \_\_\_\_\_
10. (a) Explain what each of the 4 parts of the following expression means in terms of a graph and then write the calculus expression which is equivalent to it.

$$\lim_{\Delta x \rightarrow 0} \sum_{x=a}^b f(x) \Delta x$$

- (b) List the following rules, facts, or formulas.
- a. Power rule for integration
  
  - b. Integration rules for the 6 trig functions
  
  - c. Integration rules for  $\ln x$ ,  $e^x$ , and  $a^x$ .
  
  - d. Integration rules for the 3 primary inverse trig functions
  
  - e. List the formula for the Mean Value Theorem for Integrals and explain what it represents in terms of a graph. (*Must include a diagram.*)