Formulas to MEMORIZE for the Chapter 6 Test

1. $\int u^n \, du = \frac{u^{n+1}}{n+1} + C, \quad n \neq -1$

2. $\int \frac{1}{u} \, du = \ln \left| u \right| + C$

3. $\int e^{ku} \, du = \frac{e^{ku}}{k} + C$

4. $\int \sin ku \, du = -\frac{\cos ku}{k} + C$

5. $\int \cos ku \, du = \frac{\sin ku}{k} + C$

6. $\int \sec u \tan u \, du = \sec u + C$

7. $\int \sec^2 u \, du = \tan u + C$

8. $\int \csc u \cot u \, du = -\csc u + C$

9. $\int \csc^2 u \, du = -\cot u + C$

10. $\int a^u \, du = \frac{1}{\ln a} a^u + C$

Substitution Method $\int_a^b f(g(x)) \, g'(x) \, dx = \int_{g(a)}^{g(b)} f(u) \, du$

where $u = g(x)$ and $du = g'(x) \, dx$

Integration By Parts $\int u \, dv = uv - \int v \, du$ (use u = LIPET)

Exponential Growth And Decay Equations $\frac{dy}{dt} = ky \quad \rightarrow \quad y = y_0 e^{kt}$

Euler's Method $y_{n+1} = y_n + f(x_n, y_n) \Delta x$ where $\frac{dy}{dx} = f(x, y)$