NAME _____ **MR. TURICK**

DATE_____ **AP CALCULUS**

AP CALCULUS FINAL EXAMINATION TOPICS:

(1.) Graphs of derivatives and integrals

a. Draw a possible picture of a function given certain parameters

(2.) Summations

a. $\sum_{i=1}^{n} c = cn$

b. $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$

c. $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$

(3.) Approximations

a. LHS
b. RHS
c. TRAP
d. MID
e. Riemann Sums
   - **i.** $\lim_{n\to\infty} \sum_{i=1}^{n} f(x_i)\Delta x$

(4.) Integration

a. Rules
   - i. Power rule
   - ii. Trig functions
   - iii. Exponentials/Logarithmic
   - iv. Substitution
   - v. Integration by parts

b. Definite vs. Indefinite integrals
c. Average value of a function:
   - i. $\frac{1}{b-a}\int_{a}^{b} f(x)dx$

(5.) Fundamental Theorem of Calculus

a. **FTC I:** $\int_a^b f(x)dx = F(a) - F(b)$

b. **FTC Part II**: $\frac{d}{dx}\int_a^x f(t)dt = f(x)$

(6.) Finding Area using an integral

a. Bounded area
b. Positive vs Negative area
c. With respect to y

(7.) Finding Volume using an integral

a. Tiling
b. Discs/Washers
c. Shells

(8.) Differential Equations

a. Easy
b. Separable
c. Slope Fields

(9.) Free Response Questions