Math 13 Study Guide for Test 2

Derivative Applications

- Curve sketching, including exp and log equations
- L’Hopital’s rule
- Applied max/min problems
- Maclaurin and Taylor polynomials

Study Problems: 284#11,21; 320#23,45,55; 350#10,19; 646#3a,11,21
Answers: 350#10. base = $\sqrt{2}R$, height = $\frac{\sqrt{2}}{2}R$

Indefinite Integrals

- The 19 rules from class
- Integration by $u$-substitution

Study Problems: 393#5,17,31,33; 526#6,10,14; 541#25,27;
Answers: 526#6. $\frac{1}{6} \tan^{-1}\left(\frac{3x}{2}\right)$, #10. $\frac{1}{2} \sin^{-1}(x^2)$, #14. $e^{\tan^{-1}x}$

Definite Integrals

- Summation formulas: $\sum_{k=1}^{n} c = cn$, $\sum_{k=1}^{n} k = \frac{n(n+1)}{2}$, $\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$
- Left and right endpoint approximations of definite integrals
- $\int_{a}^{b} f(x) \, dx$ using the formal definition (as a limit of Riemann sums)

Study Problems: 405#39,43; 444#39,40
Answers: 444#40. $\frac{2}{3}$

Applications of Definite Integrals

- Area between curves
- Volume of solids of revolution

Study Problems: 473#4,9; 480#9,31
Answers: 473#4. $\frac{10}{3}$

Proof To Know: The Fundamental Theorem of Calculus

Study your notes, homework, and quizzes. Good Luck!