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AP Cal Review Sheet
MVT Integrals, 2nd FTC, Integration, Trapezoidal Rule

1. I was out collecting data yesterday and tried to use it to approximate a function $y = f(x)$. Use my data to

approximate $\int_0^3 f(x)dx$ using the following methods:

- Left end-point Riemann Sums
- Right end-point Riemann Sums
- Trapezoidal Rule

X	0	1/2	1	3/2	2	5/2	3
Y	3	4	1	5	2	3	4

2. Given $f(x) = x^2 + 1$, Evaluate the error in evaluating the area using the Trapezoidal Rule with 3 equal subintervals. How can we reduce the error?

3. $\int 6x(2x^2 + 3)^5 dx$

4. $\int x^2 \sqrt{x^3 - 1} dx$

5. $\int 2 \cot^4 x \csc^2 x dx$

6. If $f(x)$ is even and $\int_0^5 f(x) = -10$, find $\int_{-5}^5 f(x) dx$

7. If $f(x)$ is odd and $\int_0^5 f(x) = -10$, find $\int_{-5}^5 f(x) dx$

8. Solve the differential equation: $\frac{dy}{dx} = \frac{6x^3}{\sqrt{x^4 - 1}}$.

9. $\int_4^6 2x(x^2 + 3)^3 dx$

10. $\int \frac{1}{3\sqrt{x}} dx$

11. $\int_1^4 \frac{2}{\sqrt{x}(3 - \sqrt{x})^3} dx$

12. $\int_5^7 \frac{5x}{2\sqrt{x-5}} dx$

13. $\frac{d}{dx} \int_2^{\sin^2(2x)} \frac{\sqrt{t^2 - 1}}{t + 3} dt$

14. If $f(t) = \int_{2x+1}^{x^2-x} \frac{t^2 + 5t + 1}{t} dt$. Find $f'(t)$.