

Calculus - Chapter 5 Practice Test

Note: This is slightly longer and more difficult than the actual test – just so that you're prepared! ☺

1. Approximate the area below the curve $f(x) = \sin(x)$ on $[1, 5]$ using the rectangle method with 4 rectangles and by using right endpoint of each interval to determine the height.
2. Express $\int_0^4 (x^2 + 1)dx$ as the limit of a Riemann sum but do not evaluate.
3. Evaluate $\frac{d}{dx} \int_{10}^x \tan(v + 1) dv$.
4. Evaluate $\frac{d}{dx} \int_{-17}^{\ln x} e^{3t-4} dt$.
5. Evaluate $\int_0^3 |3x - 5| dx$ using three methods:
 - a. By graphing it and setting up two integrals and evaluating algebraically.
 - b. By graphing it and interpreting it geometrically and solving using areas of shapes.
 - c. By using your built-in graphing calculator feature.
6. Evaluate $\int (\frac{3}{x} - \frac{5x^2}{3} + x^{-\frac{2}{5}}) dx$.
7. Evaluate $\int x^4(1 + x^9) dx$.
8. Evaluate $\int (\frac{1}{\sqrt{1-x^2}} - \csc^2 x + \frac{1}{4x-2}) dx$.
9. Evaluate $\int \frac{3x dx}{\sqrt{9x^2-4}}$.
10. Evaluate $\int \frac{\sin(2x)}{\cos(2x)} dx$. (Hint: It's *not* the substitution $u=2x$. ☺)
11. Evaluate $\int (4 - \sin w)^9 \cos w dw$
12. Find $\int_{-1}^4 (f(x) - 3g(x)) dx$ if $\int_{-1}^4 f(x) dx = 4$ and $\int_{-1}^4 g(x) dx = -3$.
13. Find the area under the curve $y = \sin(3x) + 1$ on the interval $[0, \frac{\pi}{3}]$, algebraically.
14. Evaluate $\int_0^4 (x - 3)^2 dx$.
15. Evaluate $\int_2^3 \frac{(\ln x)^3}{x} dx$.
16. Evaluate $\int_2^{10} x\sqrt{x-1} dx$.