

Math 125 Exam #1 Practice Problems

Exam #1 covers sections 5.1-5.5, 4.10, and Appendix E. You will have 75 minutes for the exam and can use a calculator and a notesheet (8.5×11 , both sides, handwritten).

Here are **some** practice problems. You should also look at previous homework problems and worksheets.

1. Extra problems from the text:

Integrals: Pgs. 431-433: 1-5, 7-9, 11-37 (Odd), 43-48, 56-61, 65, 70

Antiderivatives: Pg. 363: 65-72

Sigma Notation: Pg. A38: 2-20 (Even), 25-31 (Odd), 44, 45

2. $f(x) = 3\sin(\frac{1}{2}x)$

(a) Estimate the area of the region under the curve of f between $x = 0$ and $x = 2\pi$ using 4 approximating right-end rectangles.

(b) Write the exact area under the curve of f between $x = 0$ and $x = 2\pi$ as a limit of a sum of approximating right-end rectangles. Do not evaluate this limit.

(c) Find the exact area under the curve of f between $x = 0$ and $x = 2\pi$ using the definite integrals and the FTC.

3. For $x > 0$, if $g(x) = \int_3^{\ln(x)} [t^2 + 4\sin(t)] dt$, what is $g'(x)$?

4. If $h(x) = \int_2^4 \frac{e^t}{t^8 - 4t} dt$, what is $h'(x)$?

5. $\int \frac{x^2}{1+x^6} dx = ?$ (Hint: Choose the right u for substitution.)

6. $\int_{-\pi/2}^{\pi} [\cos(t) + \frac{3}{\pi}] dt = ?$

7. $\int \frac{\cos\sqrt{x}}{\sqrt{x}} dx = ?$

8. Is $\frac{1}{2}x^2\ln(x) - \frac{1}{4}x^2$ an antiderivative of $x\ln(x)$?

9. Suppose $f''(x) = x^3 + \frac{1}{x^2}$, $f'(1) = 0$, and $f(1) = 1$. Find $f(x)$.