

Math 163 - Calculus - Exam 1 - Practice
September 16, 2026

Name: _____

**On the exam you must show your
work to receive full credit.**

1.

$$\int x^4 e^{3x} dx =$$

2.

$$\int \frac{4x - 1}{x^2 - 5x - 14} dx =$$

3.

$$\int x^4 \sec^2(x^5) dx =$$

4.

$$\int \sin^5 \theta \, d\theta =$$

5.

$$\int \frac{x^5}{\sqrt{1-4x^2}} \, dx =$$

6.

$$\int 2x \sec^{-1} x \, dx =$$

7.

$$\int \ln(\sqrt{x}) \, dx =$$

8.

$$\int \sec^3 \theta \, d\theta =$$

9.

$$\int e^{2x} \sin 3x \, dx =$$

10.

$$\int \frac{x^2}{\sqrt{16-x^2}} \, dx =$$

11.

$$\int \frac{3x^2 + 8x + 6}{(x+1)^3} \, dx =$$

Scratch work

Scratch work

$$\begin{aligned}\sin 2x &= 2 \sin x \cos x \\ \cos 2x &= \cos^2 x - \sin^2 x\end{aligned}$$

$$\begin{aligned}\cos^2 \theta &= \left(\frac{1}{2}\right)(1 + \cos 2\theta) \\ \sin^2 \theta &= \left(\frac{1}{2}\right)(1 - \cos 2\theta)\end{aligned}$$

$$\begin{aligned}\sin A \cos B &= \frac{1}{2} \sin(A - B) + \frac{1}{2} \sin(A + B) \\ \sin A \sin B &= \frac{1}{2} \cos(A - B) - \frac{1}{2} \cos(A + B) \\ \cos A \cos B &= \frac{1}{2} \cos(A - B) + \frac{1}{2} \cos(A + B)\end{aligned}$$