



University of Connecticut
Department of Mathematics

MATH 1132

PRACTICE INTEGRATION EXAM

SPRING 2016

NAME: _____

Instructor Name: _____ Section: _____

TA Name: _____ Discussion Section: _____

Read This First!

- This is a practice integration exam. *It has more problems than will appear on the actual exam.* The problems here are representative of the types that you need to have expertise on to do well on the actual exam. **The exam will cover Sections 7.1, 7.2, 7.3 and 7.4 only.**
- In order to receive full credit on a problem you would need to show **ALL** work: solution methods must be complete, logical and understandable.
- Books or other written references are **NOT** allowed.
- Calculators or other computational aids are **NOT** allowed.

Trigonometric identities and formulas:

1. $\sin^2 \theta + \cos^2 \theta = 1$

3. $\sin 2\theta = 2 \sin \theta \cos \theta$

5. $\cos^2 \theta = \frac{1 + \cos 2\theta}{2}$

2. $\tan^2 \theta + 1 = \sec^2 \theta$

4. $\cos 2\theta = \cos^2 \theta - \sin^2 \theta$

6. $\sin^2 \theta = \frac{1 - \cos 2\theta}{2}$

Evaluate the following integrals.

1. $\int \sin^2 x \, dx$

2. $\int \sin^3 x \, dx$

3. $\int \sin x \cos x \, dx$

4. $\int \frac{\tan x}{\cos^2 x} \, dx$

5. $\int \sin x \cos^3 x \, dx$

6. $\int x^2 e^x \, dx$

7. $\int x \cos(2x) \, dx$

8. $\int x^2 \cos x \, dx$

9. $\int x^3 \ln x \, dx$

10. $\int \frac{dx}{x^2 - 9}$

11. $\int \frac{6x + 2}{x^2 + 3x + 2} \, dx$

12. $\int \frac{x + 2}{x^2 + 3x - 4} \, dx$

13. $\int \frac{10}{(x - 1)(x^2 + 9)} \, dx$

14. $\int \frac{4x}{(x + 1)(x^2 + 1)} \, dx$

15. $\int \frac{t + 3}{t^3 - t} \, dt$

16. $\int \frac{2x - 3}{x^3 + 4x} \, dx$

17. $\int \frac{dx}{\sqrt{16 - x^2}}$

18. $\int \frac{1}{x^2 \sqrt{4 - x^2}} \, dx$

19. $\int \frac{x^3}{\sqrt{4 + x^2}} \, dx$

20. $\int \frac{x^2}{\sqrt{9 - x^2}} \, dx$
