

Practice Integrals for Math 113

1.  $\int x e^{x^2} dx$

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

3.  $\int \frac{e^{2x}}{1 + e^{2x}} dx$

4.  $\int \frac{e^x}{1 + e^{2x}} dx$

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

6.  $\int \ln x dx$

7.  $\int \frac{5x^2 - 11x + 7}{(x^2 + 1)(x - 2)} dx$

8.  $\int \frac{x^2}{1 + x^2} dx$

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

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

**Answers.** 1.  $\frac{1}{2}e^{x^2} + C$  2.  $x^2 e^x - 2x e^x + 2e^x + C$  3.  $\frac{1}{2} \ln(1 + e^{2x}) + C$  4.  $\tan^{-1}(e^x) + C$   
5.  $\frac{1}{2}x - \frac{1}{12} \sin 6x + C$  6.  $x \ln x - x + C$  7.  $\ln|x - 2| + 2 \ln|x^2 + 1| - 3 \tan^{-1} x + C$   
8.  $x - \tan^{-1} x + C$  9.  $-\sqrt{9 - x^2} + C$  10.  $3 \ln \left| \frac{3 - \sqrt{9 - x^2}}{x} \right| + \sqrt{9 - x^2} + C$