

**Math 1552, Integral Calculus**  
**Section 4.8: Antiderivatives**

Name:

Evaluate the following indefinite integrals.

1.  $\int \left(\sqrt{x} - \frac{1}{x}\right)^2 dx$

2.  $\int [4^{-2x} + e^{-5x}] dx$

3.  $\int \left(\frac{e^{\sqrt{x}} + x^{\sqrt{x}}}{\sqrt{x}}\right) dx$

4.  $\int \left(\frac{1}{1+9x^2}\right) dx$

5.  $\int \left( \frac{2}{3x} - \frac{1}{\sqrt{4-x^2}} \right) dx$

6.  $\int \cot^2(5x) dx$  (HINT: use a trig formula relating  $\cot^2 x$  to  $\csc^2 x$ .)

Answers

1.  $\frac{1}{2}x^2 - 4\sqrt{x} - \frac{1}{x} + C$

2.  $-\frac{1}{2\ln 4}4^{-2x} - \frac{1}{5}e^{-5x} + C$

3.  $2e^{\sqrt{2}}\sqrt{x} + \frac{1}{\sqrt{2}+1/2}x^{\sqrt{2}+1/2} + C$

4.  $\frac{1}{3}\tan^{-1}(3x) + C$

5.  $\frac{2}{3}\ln|x| - \sin^{-1}\left(\frac{x}{2}\right) + C$

6.  $-\frac{1}{5}\cot(5x) - x + C$