

## Supplementary Integration Problems

### Sections 4.1 through 5.4

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Each antiderivative on this page can be found using techniques developed in sections 4.1 through 5.4. These are practice problems only. This is not a mandatory exercise, nor will successful completion of these problems contribute to your grade in any way. A solution set will not be supplied. (You can always check your result by differentiation)

1.  $\int \frac{x}{\sqrt{1-x^2}} dx$
2.  $\int \frac{\cos x}{\sqrt{\sin x}} dx$
3.  $\int \sqrt[3]{3x+1} dx$
4.  $\int \frac{x+1}{\sqrt{2x}} dx$
5.  $\int \frac{3 \sin x - 2 \sin x \cos x}{1 - \cos^2 x} dx$
6.  $\int \frac{x-1}{x+1} dx$
7.  $\int \frac{\sqrt{1+\sqrt{x}}}{\sqrt{x}} dx$
8.  $\int \frac{\cos^2 x + \sin x + 1}{1 + \sin x} dx$
9.  $\int (1 + \cos x)^3 \sin x dx$
10.  $\int (x^2 + 1)^2 dx$
11.  $\int \frac{e^{\sqrt{x+2}}}{\sqrt{x+2}} dx$
12.  $\int \frac{x^3}{\sqrt{1+x^4}} dx$
13.  $\int x^{1/3} \sqrt{x^{4/3} + 2} dx$
14.  $\int \sin x (e^{\cos x}) dx$
15.  $\int \frac{x^2 - 2x + 3}{x+1} dx$
16.  $\int \frac{3x}{e^{\ln \sqrt{x+2}}} dx$
17.  $\int \frac{\operatorname{cosec}^2 3x}{1 + \cot 3x} dx$
18.  $\int \frac{e^{2 \ln(x+2)}}{x} dx$
19.  $\int \frac{\sin x \cos x}{2 + \sin x} dx$
20.  $\int \frac{x+1}{3x^2 + 6x + 1} dx$
21.  $\int \frac{\sin^2 x - \sin x - 2}{1 + \sin x} dx$
22.  $\int \frac{(\ln x)^2}{x} dx$
23.  $\int \frac{6}{\sqrt{x}(1 + 3\sqrt{x})} dx$
24.  $\int (\tan^3 2x)(\sec^2 2x) dx$
25.  $\int \frac{x}{e^{2x^2}} dx$
26.  $\int \frac{\sin x}{2 + \cos x} dx$
27.  $\int \frac{x^3}{2 + x^4} dx$
28.  $\int \frac{1}{x\sqrt{2x}} dx$
29.  $\int e^{2x}(5 + e^x)^4 dx$
30.  $\int \frac{\sqrt{1 + 3 \ln x}}{2x} dx$
31.  $\int \frac{e^{4x} - 2e^{2x} + 1}{e^x} dx$
32.  $\int \ln(3e^{2x}) dx$