Answers to Practice Exam 2 for the First Midterm

1.
$$\int \frac{\mathrm{e}^{2x}}{\mathrm{e}^{2x}+1}\,\mathrm{d}x = \boxed{\frac{1}{2}\ln\left|\mathrm{e}^{2x}+1\right| + C}$$

2.
$$\int \mathrm{e}^{2x}\cos 3x\,\mathrm{d}x = \boxed{\frac{2}{13}\mathrm{e}^{2x}\cos 3x + \frac{3}{13}\mathrm{e}^{2x}\sin 3x + C}$$

3.
$$\int \left(\sin^7 x\right)\sqrt{\cos x}\,\mathrm{d}x = \boxed{-\frac{2}{3}(\cos x)^{\frac{3}{2}} + \frac{6}{7}(\cos x)^{\frac{7}{2}} - \frac{6}{11}(\cos x)^{\frac{11}{2}} + \frac{2}{15}(\cos x)^{\frac{15}{2}} + C}$$

4.
$$\int \frac{5x^3+2x^2-12x-8}{x^4-8x^2+16}\,\mathrm{d}x = \boxed{2\ln|x+2| + \frac{1}{x+2} + 3\ln|x-2| - \frac{1}{x-2} + C}$$

5.
$$\int \frac{1}{(x^2+4x+13)^{3/2}}\,\mathrm{d}x = \boxed{\frac{x+2}{9\sqrt{x^2+4x+13}} + C}$$