Reading Stewart §4.5, 6.2.

1. Compute the following indefinite integrals.
   (a) $\int x^3\sqrt{x^4+5}\,dx$
   (b) $\int \sin\left(2t+\frac{\pi}{4}\right)\,dt$
   (c) $\int \frac{\cos\sqrt{x}}{\sqrt{x}}\,dx$
   (d) $\int \frac{\sin\theta}{(1+\cos\theta)^3}\,d\theta$
2. Compute the following definite integrals.
   (a) $\int_{-2}^{3} \sqrt[3]{7x+6}\,dx$
   (b) $\int_{1/6}^{1/2} \csc(\pi t)\cot(\pi t)\,dt$
   (c) $\int_0^2 x^2\sqrt{x^3+1}\,dx$
   (d) $\int_2^5 x\sqrt{x-1}\,dx$
3. Use translation, etc. to graph $y = 2e^{-x} - 5$.
4. Compute the following limits. Don't forget to (briefly) justify/show steps.
   (a) $\lim_{x\to\infty} 1.01^x$
   (b) $\lim_{x\to-\infty} 1.01^x$
   (c) $\lim_{x\to\infty} \frac{5e^{2x}-7e^{3x}}{3e^{3x}+6e^{-3x}}$
5. Compute the derivatives of the following functions.
   (a) $f(x) = (3x^2+2x^3)e^{4x}$
   (b) $g(x) = \frac{e^x}{4e^x-1}$
   (c) $h(x) = \sqrt{3-4e^{-2x}}$
6. Compute the following definite and indefinite integrals.
   (a) $\int_0^1 (e^{2x}+x^{2e})\,dx$
   (b) $\int xe^{5x^2}\,dx$
   (c) $\int (e^x+e^{-x})^2\,dx$