

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) $\lim_{x \rightarrow \infty} 1.01^x$

(b) $\lim_{x \rightarrow -\infty} 1.01^x$

(c) $\lim_{x \rightarrow \infty} \frac{5e^{2x} - 7e^{3x}}{3e^{3x} + 6e^{-3x}}$

Note The following two problems are now not due until Friday. They will appear on Friday's assignment instead.

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) $\int x e^{5x^2} dx$

(c) $\int (e^x + e^{-x})^2 dx$