MATH 138 Calculus 2, Exercises for Chapter 1

1: (a) Find $\displaystyle\int_1^2 2x^3 - 3x^2 + x - 4 \; dx$.

(b) Find $\displaystyle\int_0^4 \sqrt{2x+1} \; dx$.

(c) Find $\displaystyle\int_1^4 \frac{2x^2 + \sqrt{x} + 1}{x} \; dx$.

(d) Find $\displaystyle\int_0^{2\pi} \left| \cos x - \sqrt{3}\sin x \right| dx$.

2: (a) Approximate $\displaystyle\int_0^{2\pi} 4^{\cos x} \; dx$ by the Riemann Sum for $f(x) = 4^{\cos x}$ using the right endpoints of 6 equal-sized subintervals of $[0, 2\pi]$.

(b) Find the exact value of $\displaystyle\int_{-1}^2 x^2 + 2x \; dx$ by calculating the limit of a sequence of Riemann sums.

3: (a) Let $\displaystyle h(x) = \int_0^x \sqrt{1 + t^3} \; dt$. Find $h'(2)$.

(b) Let $\displaystyle h(x) = \int_{\sqrt{x}}^{x\sqrt{x}} 2^{3 - \sqrt{t/2}} \; dt$. Find $h'(4)$.