Calculus I
Homework
Areas and integrals

1. Estimate the integral using a Riemann sum using the indicated sample points and interval length.

   (a) $\int_0^4 \left(\sqrt{8x+1}\right) dx$. Use four intervals of equal width, choose the sample point to be the left endpoint of each interval.

   (b) $\int_0^6 \frac{1}{x^2+1} dx$. Use three intervals of equal width, choose the sample point to be the left endpoint.

   (c) $\int_{-3.5}^{-0.5} \frac{dx}{x^2+1}$. Use three intervals of equal width, choose the sample point to be the midpoint of each interval.

   (d) $\int_0^2 \frac{dx}{1+x+x^3}$. Use $\Delta x = \frac{1}{2}$ and right endpoint sampling points.

   (e) $\int_{-2}^0 \frac{dx}{1+x+x^2}$. Use $\Delta x = \frac{2}{3}$ and left endpoint sampling points.

   (f) $\int_0^2 \frac{dx}{1+x^3}$. Use four intervals of equal width, choose the sample point to be the left endpoint of each interval.

   (g) $\int_{-2}^0 \frac{dx}{x^4+1}$. Use four intervals of equal width, choose the sample point to be the right endpoint.

   (h) $\int_{-1}^0 \frac{1}{3x^2+1} dx$. Use 3 **intervals** of equal width, choose the sampling points to be the **left endpoints** of each interval. Simplify your answer to a rational number (single fraction of two integers).