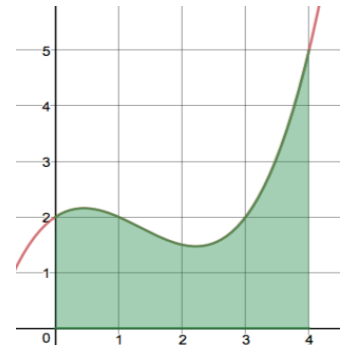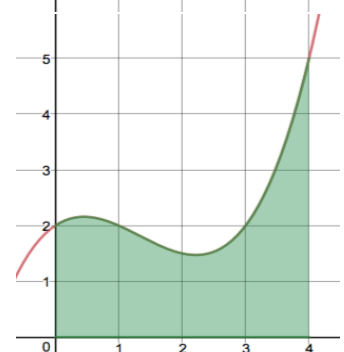# 4A.1: Approximating Area - Practice

Approximating Area

1. Approximate the area under the curve $f(x) = \frac{1}{4}x(x-1)(x-3) + 2$ on the interval $[0,4]$ using the Left-Hand, Right-Hand, Midpoint, and Trapezoidal Sums with 4 sub-intervals. Draw your rectangles or trapezoids on the graphs and find an exact approximations (is that an oxymoron?)
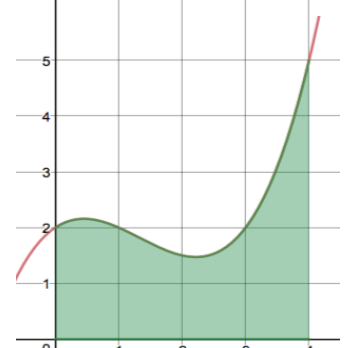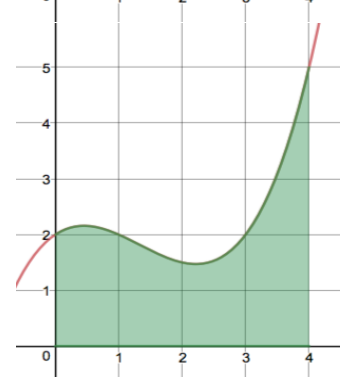
   a. Left-Hand Sum
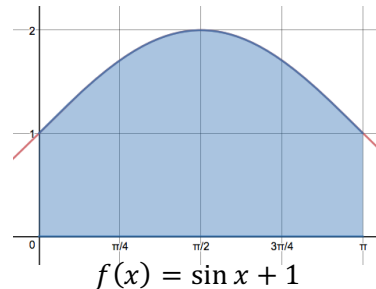
   b. Right-Hand Sum

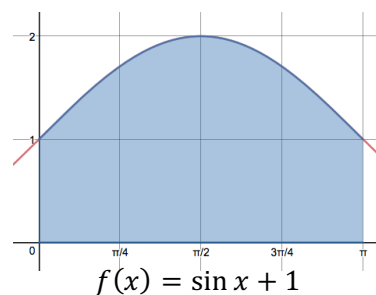   c. Midpoint Sum

   d. Trapezoidal Sum

2. Approximate the area under the curve $f(x) = \sin(x) + 1$ on the interval $[0, \pi]$ using the Left-Hand, Right-Hand, Midpoint, and Trapezoidal Sums with 4 sub-intervals. Draw your rectangles or trapezoids on the graphs and find an exact and decimal approximations.

Note: $A = \frac{\pi}{4} \cdot h_1 + \frac{\pi}{4} \cdot h_2 + \frac{\pi}{4} \cdot h_3 + \frac{\pi}{4} \cdot h_4 = \frac{\pi}{4}(h_1 + h_2 + h_3 + h_4)$ for rectangle heights h_i.
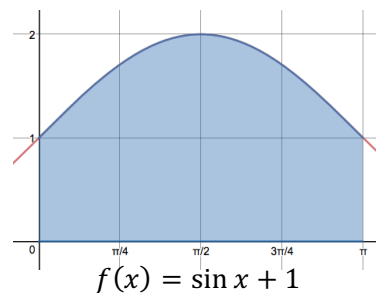
   a. Left-Hand Sum

$f(x) = \sin x + 1$

   b. Right-Hand Sum

$f(x) = \sin x + 1$

   c. Midpoint Sum (decimal only)

$f(x) = \sin x + 1$

   d. Trapezoidal Sum (decimal only)

$f(x) = \sin x + 1$