

1. [§5.1] Find the antiderivative for the following functions:

(a)  $f(x) = \frac{(x-1)^2(2x+1)}{\sqrt{x^3}}$

(b)  $g(x) = \frac{a x^3}{b^2} (2cx - \sqrt[k]{x^k})$ , assuming that  $a, b, c, d, k$  are constants.

(c)  $h(x) = \frac{2x^2+1}{x^2+1}$

2. [§5.1] Given  $f'(x) = e^x + \frac{4}{3}x^{-2/3}$ , find  $f(x)$  if  $f(1) = e$ .

3. [§5.2] Given  $f(x) = x^2 + x + 1$

- Approximate the area between the curve of  $f$  and the  $x$ -axis on the interval  $[0,2]$  using 4 rectangles and right point sums.
- Find the EXACT area between the curve of  $f$  and the  $x$ -axis on the interval  $[0,2]$  by using area as the limit of a sum and summation formulas.