

MATH 1420: WORKSHEET FOR SECTION 5.1
RIEMANN SUMS

Consider the function $f(x) = x^2 + x$ on the interval $[0, 4]$.

- (1) Write the left Riemman sum for approximating the area under $f(x)$ over this interval with $N = 4$ pieces.
- (2) Do the same thing for $N = 20$.
- (3) Do both of these for the right Riemann sum.
- (4) Now that you've written out all these sums, compute the values for the two $N = 4$ sums.
- (5) Look at the graph of $f(x)$ on this interval. Judging from its shape, are the left Riemann sums an underestimate or an overestimate of the true area? What about the right Riemann sums?

Consider the function $g(x) = 2 + e^{-x}$ on the interval $[1, 3]$.

- (1) Write the left Riemman sum for approximating the area under $g(x)$ over this interval with $N = 4$ pieces.
- (2) Do the same thing for $N = 40$.
- (3) Do both of these for the right Riemann sum.
- (4) Now that you've written out all these sums, compute the values for the two $N = 4$ sums.
- (5) Look at the graph of $g(x)$ on this interval. Judging from its shape, are the left Riemann sums an underestimate or an overestimate of the true area? What about the right Riemann sums?