MATH 2554 **Calculus I** **Fall 2019**

Drill Handout Sections 5.1 and 5.2 November 26, 2019 Name:_____

(1) The velocity of an object is given by $v(t) = \frac{1}{5t}$ on the time interval $1 \leq t \leq 7$. Approximate the displacement of the object using $n = 3$ subintervals with left endpoints, right endpoints, and midpoints.

(2) **Approximating Net Area.** $f(t) = t^3$ is positive and negative on $[-1, 3]$.
   (a) Sketch the function on the given interval.
   (b) Approximate the net area bounded by the graph of f and the x-axis on the interval using a midpoint Riemann sum with $n = 4$.
   (c) Use the sketch from part (a) to show which intervals of $[a, b]$ make positive and negative contributions to the net area.

(3) **Net area and definite integrals** Use geometry (not Riemann sums) to evaluate the following definite integrals. Sketch a graph of the integrand, show the region in question, and interpret your result.

(a) $\int_{-4}^{2}(2x+4)\,dx$

(b) $\int_{-1}^{3}\sqrt{4-(x-1)^2}\,dx$

(c) $\int_{1}^{10} g(x)\,dx$, where $g(x) = \begin{cases} 4x & \text{if } 0 \leq x \leq 2 \\ -8x+16 & \text{if } 2 < x \leq 3 \\ -8 & \text{if } x > 3. \end{cases}$