SECTION 5.1: APPROXIMATING AREAS

Using rectangles to estimate areas of curvy curves.

1. For all parts of this problem, the goal is to estimate the area below $f(x) = \frac{1}{2}x^2 + 1$ and above the x-axis on the interval $[0, 2]$.

   (a) (R_4) Use $n = 4$ rectangles and right-hand endpoints.

   (b) (L_4) Use $n = 4$ rectangles and left-hand endpoints.

   (c) (M_4) Use $n = 4$ rectangles and midpoints endpoints.

(d) Use R_{10}

2. Oil leaked out of a tank at a rate of $r(t)$ liters per hour. The rate decreased as time passed and values of the rate atn 2-hour time intervals are shown in the table. Estimate how much oil leaked out. What method are you using? Is is an over estimate? Underestimate? Can you tell?

time, t, (in hours)	0	2	4	6	8	10
rate, $r(t)$, (in liters/hour)	8.7	7.6	6.8	6.2	5.7	5.3