Riemann Sums - Equal Width

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Let f be continuous and non-negative on the interval [a, b], then a **Riemann Sum** estimates distances, area, total cost, etc. by sums of areas of rectangles of *n* width. (Area under the curve)

To find the Riemann Sums where the *n*'s are equal:

1. Area = __ + __ + __ + __ + ... (*n* is # of blanks = # of rectangles)
2. Each blank has (ht.)(Δx) of each rectangle where $\Delta x = \frac{b - a}{n}$.
3. If *f* is an analytical equation (not table or graph) set up a table where the *x*'s count by Δx and *f*(*x*) is the height at that *x*-value.
4. The problem situation determines which height, *f*(*x*) to use:
   a) the left height (LRAM) or right height (RRAM) of the rectangle
   b) the lowest height of the rectangle (lower or inscribed)
   d) the greatest height of the rectangle (upper or circumscribed)
   e) the height of the middle of the rectangle (midpoint)

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1. Set up an approximation of the area of the function $y = \sqrt{1 - x^2}$ using the LRAM with 5 rectangles of equal width over [0, 1].

2. Set up an estimate of the area between the curve *g*(*x*) and the *x*-axis using the lower Riemann sums with 4 subintervals of equal width for [-2, 2].