MA 16010 Lesson 30: Definite Integrals I

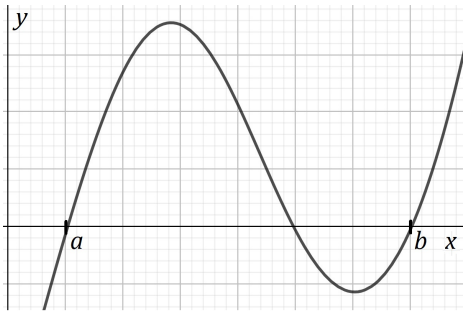
Recall: To approximate the signed area under the curve $y = f(x)$, over the interval $[a, b]$, we used **left/right Riemann sums**

$L_n =$ $R_n =$

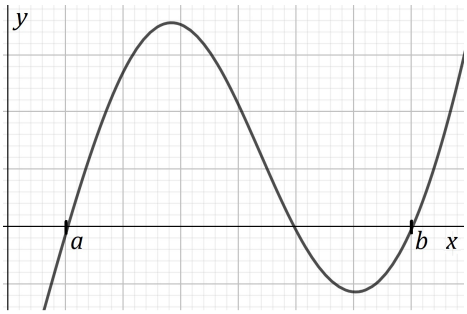
As we increase n, the area is approximated better and better; to get

the area precisely, we _____.

$$\int_a^b f(x)\mathrm{d}x =$$

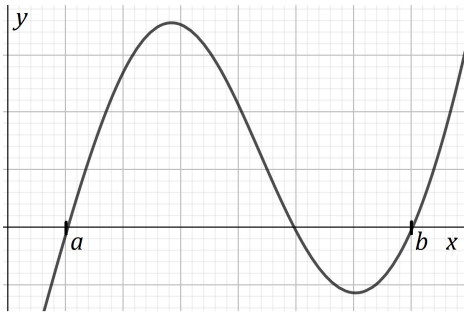


L_6



L_{12}

...



$\int_a^b f(x)\mathrm{d}x$

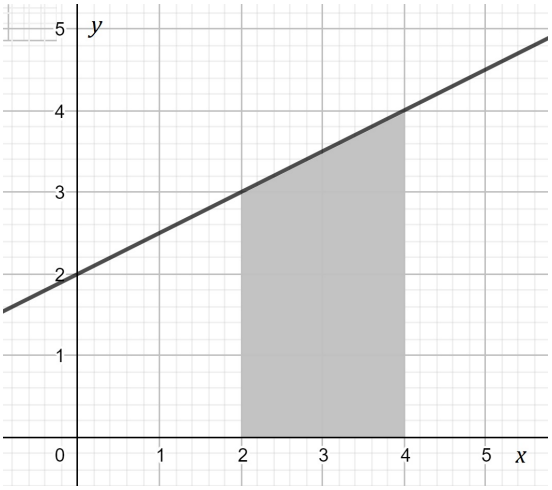
We can use geometric meaning of areas to "compute definite integrals".

Exercise: Evaluate $\displaystyle\int_{-1}^{2} 2x\,\mathrm{d}x$ (by using geometric formulas).

Exercise: Evaluate $\displaystyle\int_2^7 -3\,\mathrm{d}x$ (by using geometric formulas).

Exercise: Evaluate $\displaystyle\int_1^4 (x+2)\,\mathrm{d}x$ (by using geometric formulas).

Exercise: Find the definite integral that expresses the (signed) area of the region sketched below.



Exercise: Find the definite integral that expresses the (signed) area of the region sketched below.