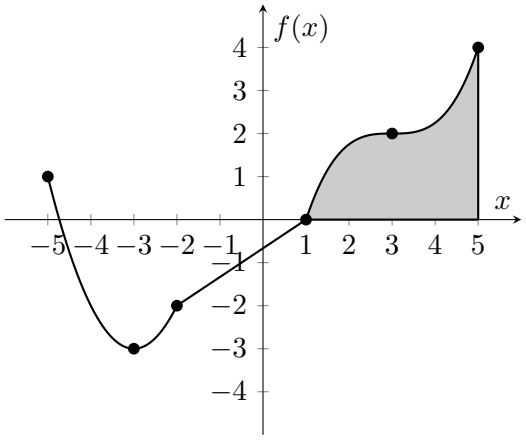
5. [13 points] The function below has a local minimum at $x = -3$, is linear on $[-2, 1]$, and has an inflection point at $x = 3$.



For parts **a.** and **b.**, use the graph of $f(x)$ to determine if the listed quantities are over- or under-estimates for the relevant integral, and write the word OVERESTIMATE or UNDERESTIMATE as appropriate. If there is not enough information, write NI.

a. [4 points] $\int_{-3}^{3} f(x)dx$

LEFT(4) _____ RIGHT(4) _____

MID(4) _____ TRAP(4) _____

b. [4 points] $\int_{-5}^{1} f(x)dx$

LEFT(12) _____ RIGHT(12) _____

MID(12) _____ TRAP(12) _____

c. [5 points] The function on $[1, 5]$ is defined by $\frac{1}{4}(x-3)^3 + 2$. Write, but do not solve, an integral giving the volume of the shaded region rotated around $y = -2$.