Name _____

Homework 5
Sections 7.5 & 7.6

1. (14) Use all five numerical integration methods with the appropriate $n$ to approximate $\int_1^4 f(x)\,dx$ for the function whose values are given in the table below.

| $x$ | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 |
|---|---|---|---|---|---|---|---|
| $f(x)$ | 2.5 | 1.125 | 0.5 | 1.375 | 4.5 | 10.625 | 20.5 |

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List your answers here, and show your work below and on the back of this page.

LEFT(6)=_____ MID(3)=_____ SIMP(3)=_____

RIGHT(6)=_____ TRAP(3)=_____

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2. (2ea) Sketch a graph for each of the following descriptions. [While you don't have to produce a work of art, please make an effort to draw neatly and clearly convey what you are trying to.]

   (a) $f(x)$ is a function for which, on the interval $[-1, 7]$, LEFT(8)$< \int_{-1}^{7} f(x)\, dx <$RIGHT(8) and TRAP(4)$< \int_{-1}^{7} f(x)\, dx <$MID(4).

   (b) $f(x)$ is a function for which, on the interval $[1, 5]$, LEFT(3)$>$RIGHT(3), and TRAP(3)=MID(3)=SIMP(3)$= \int_{1}^{5} f(x)\, dx$.

   (c) $g(x)$ is a function where, on the interval $[0, 5]$, the error from the left rule is positive, and the error from the midpoint rule is negative.