Problem statement a) Suppose $f(x)$ is defined on $0 \le x \le 1$ by the following rule:

$$f(x) \text{ is the first digit in the decimal expansion for } x.$$

For example, $f(1/2) = 5$ and $f(0.719) = 7$. Sketch the graph of $y = f(x)$ on the unit interval with appropriate scales for x and for y. Use a graphical interpretation of the definite integral to compute $\int_0^1 f(x)\,dx$.

c) Suppose the function $g(x)$ is defined as follows:

$$g(x) \text{ is the second digit in the decimal expansion for } x.$$

For example, $g(0.437) = 3$. Compute $\int_0^1 g(x)\,dx$. Again, a graph may help.