

3. [13 points] Use the table and the fact that

$$\int_0^{10} f(t) dt = 350$$

to evaluate the definite integrals below exactly (i.e., no decimal approximations). Assume $f'(t)$ is continuous and does not change sign between any consecutive t -values in the table.

t	0	10	20	30	40	50	60
$f(t)$	0	70	e^5	e^3	0	$\pi/2$	π

a. [4 points] $\int_0^{10} t f'(t) dt$

b. [4 points] $\int_{20}^{30} \frac{f'(t)}{f(t)} dt$

c. [5 points] $\int_{50}^{60} f(t) f'(t) \sin(f(t)) dt$

1. [12 points] Suppose that f is a twice differentiable function with continuous second derivative. (That is, both f and f' are differentiable, and f'' is continuous.) The following table gives some values of f and f' .

x	0	1	2	3	4	5	6	e^3
$f(x)$	7	5	-1	0	11	-3	2	9
$f'(x)$	3	-4	-2	4	-5	0	-1	2

In parts (a) through (c) below, calculate the exact numerical value of the integral. Write “NOT ENOUGH INFO” if there is not enough information to find the exact value. Be sure to show your work clearly. No partial credit will be given for estimates.

a. [4 points] $\int_1^{e^3} \frac{f'(\ln x)}{x} dx$

b. [4 points] $\int_0^4 x f''(x) dx$

c. [4 points] $\int_2^6 f'(x) [f(x)]^2 dx$