1. [8 points] Suppose that $f(x)$ is a continuous function, and $F(x)$ is an antiderivative of $f(x)$. Assume that $\int_0^1 F(x)\,dx = 3$. A table of values for $F(x)$ is given below.

x	1	2	3	4	5
$F(x)$	1	-2	-4	3	1

Calculate the following quantities **exactly**. Show your work and do not write any decimal approximations.

a. [2 points] $\displaystyle\int_2^4 f(x)\,dx$

b. [2 points] The average value of f over the interval $[3, 5]$.

c. [2 points] $\displaystyle\int_0^1 x f(x)\,dx$

d. [2 points] $\displaystyle\int_0^1 f(2x + 1)\,dx$