1. (11 points) (a) What is the average of the function $x^3$ on the interval $1 < x < 3$?

(b) If it is known that $\int_1^3 f(x) \, dx = 4$ and $\int_1^3 (f(x))^2 \, dx = 5$, then
$$\int_1^3 (1 + f(x))^2 \, dx =$$

(c) A function $f(x)$ has a graph as shown below, and it is known that $\int_0^4 f(x) \, dx = 10$, while the area of the region below the x-axis and above the graph of $f$ is 2. Find
$$\int_0^3 f(x) \, dx =$$

(d) The average price (in dollars) of a new house that is $A$ square feet in area is a function $P = f(A)$. What are the units of $dP/dA = f'(A)$.