The function f is twice differentiable. Select values of f and f' are given in the table below. f has exactly two critical numbers on the interval $(1, 12)$.

x	1	2	5	7	10	12
$f(x)$	2	4	2	1	7	9
$f'(x)$	1	0	-2	0	$3/2$	1

a) Use the table to approximate $f''(6)$.

b) Use a trapezoidal sum of four subintervals to approximate $\displaystyle\int_1^{10} f(x)\, dx$.

c) Find $\displaystyle\int_1^{12} (f'(x) + 2)\, dx$.

d) Verify that $\displaystyle\lim_{x \to 12} \frac{\int_1^x (f'(t) + 2)\, dt - 29}{6x - 72} = \frac{1}{2}$

e) Write an equation of the tangent line to f at $x = 10$. Use this line to approximate $f(11)$.

f) What is the least number of times $f(x) = 3$ on $(1, 12)$? Explain your reasoning.

g) Let $k(x) = f(2x)$. Find $k'(5)$.

h) Let $m(x) = f^{-1}(x)$, the inverse of f on the interval $(7, 12)$. Find $m'(7)$.

i) There is a gecko scurrying along a straight path such that the velocity of the gecko, $v = f'$, where velocity is measured in centimeters per second. Find the average acceleration of the gecko on the interval [5, 12]. Indicate units of measure.

j) Explain why there must be a time in the interval [5, 12] where the acceleration of the gecko will be equal to the value found in (i).