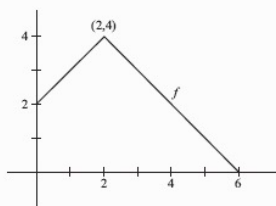


Use the graph of function f , shown below, for Questions 42–45.



42. In which of these intervals is there a value c for which $f(c)$ is the average value of f over the interval $[0, 6]$?
- I. $[0, 2]$
 - II. $[2, 4]$
 - III. $[4, 6]$
- (A) I only
 (B) II only
 (C) III only
 (D) I and II only
 (E) none of these, because f is not differentiable on $[0, 6]$

43. $\int_0^2 f'(3x) dx =$

- (A) -2
 (B) $-\frac{2}{3}$
 (C) 0
 (D) $\frac{2}{3}$
 (E) 2

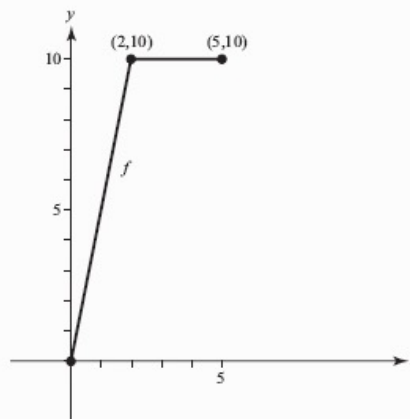
44. Let $g(x) = \int_0^2 xf(t) dt$; then $g'(1) =$

- (A) 3 .
 (B) 4 .
 (C) 6 .
 (D) 8 .
 (E) does not exist, because f is

45. Let $h(x) = x^2 - f(x)$. Find $\int_0^6 h(x) dx$.

- (A) 22
 (B) 38
 (C) 58
 (D) 70
 (E) 74

Find the average value of function f , as shown in the graph below, on the interval $[0, 5]$.



50. $\frac{d}{dx} \int_{\pi/2}^{x^2} \sqrt{\sin t} dt =$

- (A) $\sqrt{\sin t^2}$
 (B) $2x\sqrt{\sin x^2} - 1$
 (C) $\frac{2}{3}(\sin^{3/2} x^2 - 1)$
 (D) $\sqrt{\sin x^2} - 1$
 (E) $2x\sqrt{\sin x^2}$

53. Find the value of x at which the function $y = x^2$ reaches its average value on the interval $[0, 10]$.

- (A) 4.642
 (B) 5
 (C) 5.313
 (D) 5.774
 (E) 7.071