

AP[®] Exam Practice QuestionsSee LarsonCalculus.com for worked-out solutions to these questions.

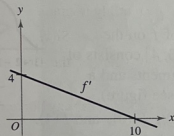
What You Need to Know

- Approximating the area under a curve using rectangles and basic geometry is often tested on the AP[®] Exam.
- An alternative form of the Fundamental Theorem of Calculus, $f(b) = f(a) + \int_a^b f'(x) dx$, is also emphasized on the AP[®] Exam.
- Some questions where technology is permitted not only encourage but also require the use of a graphing utility in evaluating definite integrals. This is the case for functions with no elementary antiderivative.

Practice Questions

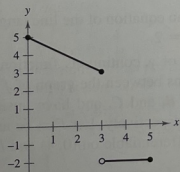
Section 1, Part A, Multiple Choice, No Technology

1. The graph of f' is shown. If $f(0) = 3$, what is the value of $f(10)$?



- (A) 0 (B) 4 (C) 20 (D) 23

2. The graph of f is shown for $0 \leq x \leq 5$. What is the value of $\int_0^5 f(x) dx$?



- (A) -1 (B) 7 (C) 8 (D) 16

3. $\int x\sqrt{16 - 3x^2} dx =$

- (A) $\frac{2}{3}(16 - 3x^2)^{3/2} + C$ (B) $-\frac{1}{4}(16 - 3x^2)^{3/2} + C$

- (C) $-\frac{1}{9}(16 - 3x^2)^{3/2} + C$ (D) $\frac{1}{9}(16 - 3x^2)^{3/2} + C$

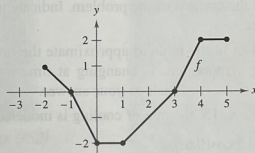
4. If $f(x) = x^3$ has an average value of 12 on the interval $[0, k]$, then $k =$

- (A) $12^{1/3}$ (B) $48^{1/4}$
(C) $24^{1/3}$ (D) $48^{1/3}$

5. The velocity of a particle is given by $v(t) = 4t^3 - 4t$ for the times $0 \leq t \leq 2$ in seconds. What is the average velocity of the particle over that interval?

- (A) 4 (B) 5
(C) 10 (D) 24

6.



The graph of a piecewise linear function f is shown above. If g is the function defined by

$$g(x) = \int_4^x f(t) dt$$

find $g(-1)$.

- (A) -6 (B) -4
(C) 4 (D) 6

✚ Section 1, Part B, Multiple Choice, Technology Permitted

7. If $0 \leq b \leq \pi$ and the area under the curve $y = \sin x$ from $x = b$ to $x = \pi$ is 0.4, what is the value of b ?

- (A) 0.927 (B) 1.159
(C) 1.982 (D) 2.214

8. Let $f(x)$ be a continuous function such that $f(1) = 2$ and

$$f'(x) = \sqrt{x^3 + 6}.$$

What is the value of $f(5)$?

- (A) 11.446 (B) 13.446
(C) 24.672 (D) 26.672