Semester 2 - Unit 6 Review

AP Calc. AB/BC

If $\int_4^{-10} g(x)\, dx = -3$ and $\int_4^6 g(x)\, dx = 5$, find $\int_{-10}^6 g(x)\, dx =$

x	0	5
$f(x)$	3	-2
$g(x)$	0	2
$g'(x)$	1	-3

Let f be the function given by $f(x) = \int_{-1}^{x} g(t)\,dt$ where g is a differentiable function. The table above gives selected values of f, g, and g'. If h is the function given by $h(x) = x^2 - e^x + 1$ for which of the following values of x is $h(x) = f'(5)$?

(A) -2.032 (B) -1.147 (C) 0 (D) 1.873 (E) 2.158

Suppose $g(x)$ is a continuous function. A table of selected values of $g(x)$ is shown below.

x	0	3	6	9	12	15	18
$g(x)$	-4	-2	3	4	9	5	1

The approximate value of $\int_0^{18} g(x)dx$ using a midpoint Riemann sum with three subintervals of equal length is
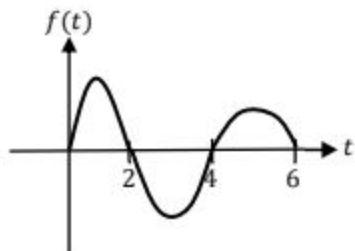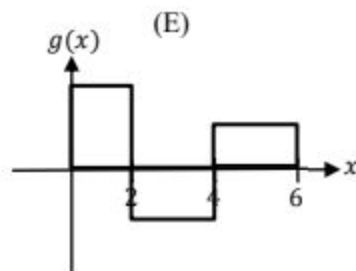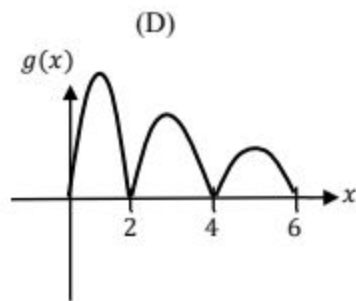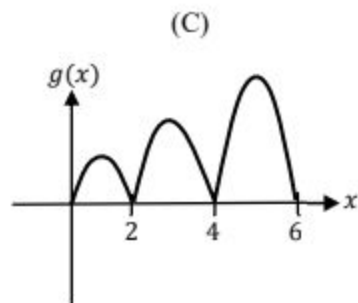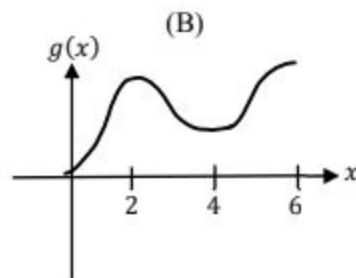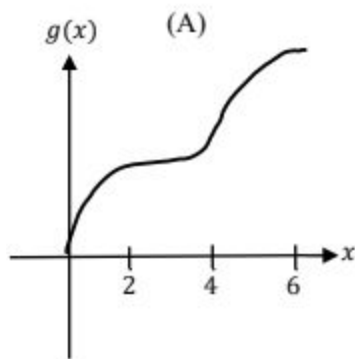
(A) 48   (B) 42   (C) 39   (D) 24   (E) 21

Let $g(x) = \int_0^x f(t)\, dt$, where $f(t)$ has the graph shown below.

$f(t)$

Which of the following could be the graph of g?

(A)

$g(x)$

(B)
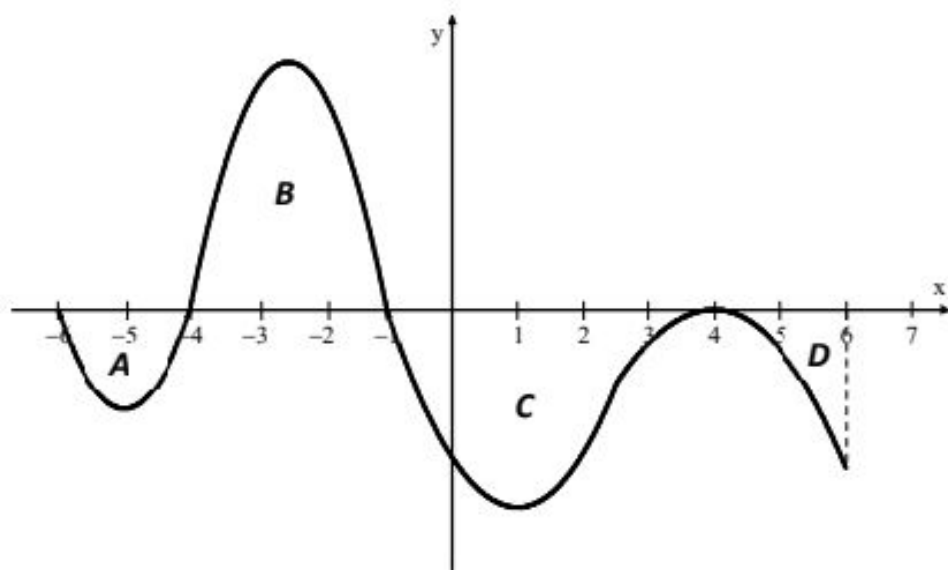
$g(x)$

(C)

$g(x)$

(D)

$g(x)$

(E)

$g(x)$

Find the following indefinite integrals.

$$\int 10x \sqrt[3]{5x^2 - 4}\, dx$$

$$\int xe^{x^2} dx$$

$$\int \sin x\, e^{\cos x}\, dx$$

$$\int \frac{1}{\sqrt{-x^2 - 8x - 15}}\, dx$$

The figure above shows the graph of the continuous function f. The regions A, B, C, and D have areas 4, 13, 16, and 3, respectively. For $-6 \le x \le 6$, the function g is defined by $g(x) = 4 + \int_{-1}^{x} f(t)\, dt$.

(a) Is there a value x, for $-1 \le x \le 4$, such that $g(x) = 0$? Justify your answer.

(b) Find the absolute minimum value of g on the interval $-6 \le x \le 6$.

(c) Find the value of $\int_{1}^{-1} f(5 - x)\, dx$

Find the value of the definite integral.

$\int_0^{\frac{\pi}{6}} \sin(3x)\cos(3x)\,dx$

$\int_0^4 \frac{2}{\sqrt{2x+1}}\,dx$

$\int_0^{\ln 3} e^x(4 - e^x)\,dx$

A curve given by the equation $x^3 + xy = 8$ has slope given by $\frac{dy}{dx} = \frac{-3x^2-y}{x}$. The value of $\frac{d^2y}{dx^2}$ at the point where $x = 2$ is

(A) -6 (B) -3 (C) 0   (D) 4   (E) undefined

Answer Key:

[Semester 2 - Unit 6 Review - Answer Key](#)