

Classroom Voting Questions: Calculus II

Section 6.4 Second Fundamental Theorem of Calculus

1. If $f(x) = \int_1^x t^4 dt$, then

- (a) $f'(x) = t^4$
- (b) $f'(x) = x^4$
- (c) $f'(x) = \frac{1}{5}x^5 - \frac{1}{5}$
- (d) $f'(x) = x^4 - 1$

2. If $f(t) = \int_t^7 \cos x dx$, then

- (a) $f'(t) = \cos t$
- (b) $f'(t) = \sin t$
- (c) $f'(t) = \sin 7 - \sin t$
- (d) $f'(t) = -\cos t$
- (e) $f'(t) = -\sin t$

3. If $f(x) = \int_2^{x^2} e^{2t} dt$, then

- (a) $f'(x) = 2xe^{2x^2}$
- (b) $f'(x) = e^{2x}$
- (c) $f'(x) = e^{2x^2}$
- (d) $f'(x) = 2e^{2x^2}$
- (e) $f'(x) = \frac{1}{2}e^{2x^2} - \frac{1}{2}e^8$

4. If $f(x) = \int_3^x \cos(e^{\sin t}) dt$, what is $f'(x)$?

- (a) $f'(x) = \cos(e^{\sin x}) - \cos(e^{\sin 3})$
- (b) $f'(x) = \sin(e^{\sin x})$
- (c) $f'(x) = \cos(e^{\sin x})$
- (d) $f'(x) = \cos(e^{\sin t})$

(e) None of the above

5. **True or False:** If f is continuous on the interval $[a, b]$, then $\frac{d}{dx} \int_a^b f(x)dx = f(x)$.

- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

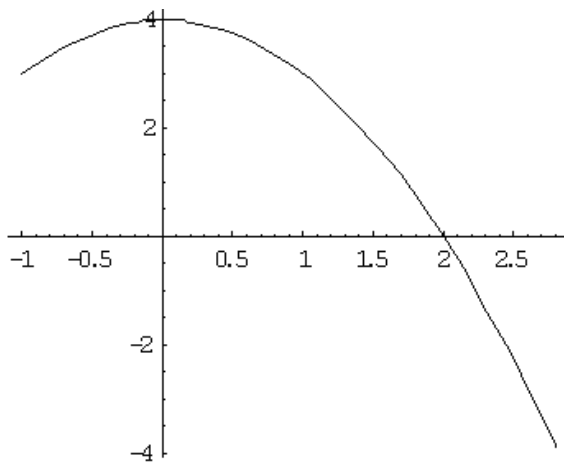
6. If f is continuous on the interval $[a, b]$, then $\frac{d}{dx} \int_a^b f(x)dx =$

- (a) 0
- (b) $f(b)$
- (c) $f(x)$
- (d) None of the above.

7. **True or False:** $\int_0^x \sin(t^2)dt$ is an antiderivative of $\sin(x^2)$.

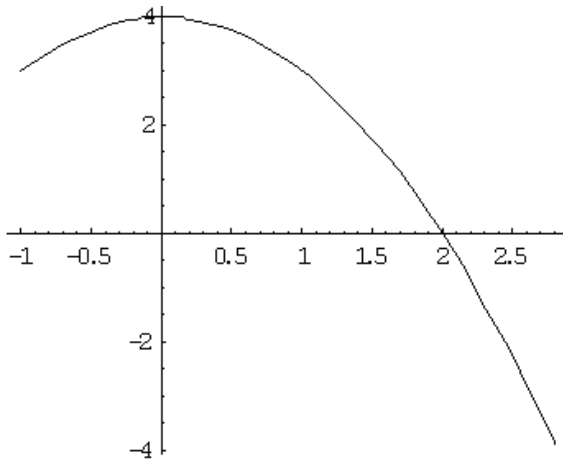
- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

8. The graph of function f is given below. Let $g(x) = \int_0^x f(t)dt$. Then for $0 < x < 2$, $g(x)$ is

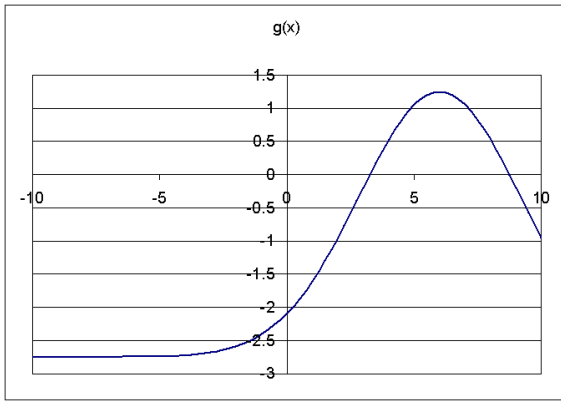


- (a) increasing and concave up.
- (b) increasing and concave down.
- (c) decreasing and concave up.
- (d) decreasing and concave down.

9. The graph of function f is given below. Let $g(x) = \int_0^x f(t)dt$. Then



- (a) $g(0) = 0$, $g'(0) = 0$ and $g'(2) = 0$
 - (b) $g(0) = 0$, $g'(0) = 4$ and $g'(2) = 0$
 - (c) $g(0) = 1$, $g'(0) = 0$ and $g'(2) = 1$
 - (d) $g(0) = 0$, $g'(0) = 0$ and $g'(2) = 1$
10. The speed of a car is given by the function $s(t) = 15t^2$, where t is in seconds, and s is in feet per second. If the car starts out a distance of 20 ft from the starting line, how far from the starting line will the car be at $t = 4$ seconds?
- (a) 240 ft
 - (b) 260 ft
 - (c) 320 ft
 - (d) 340 ft
 - (e) 6,000 ft
11. The function $g(x)$ is related to the function $f(x)$ by the equation $g(x) = \int_3^x f(x)dx$, and $g(x)$ is plotted below. Where is $f(x)$ positive?



- (a) $3 < x < 8$
- (b) $x < 6$
- (c) $2.5 < x$
- (d) $x < 2.5$