

# 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

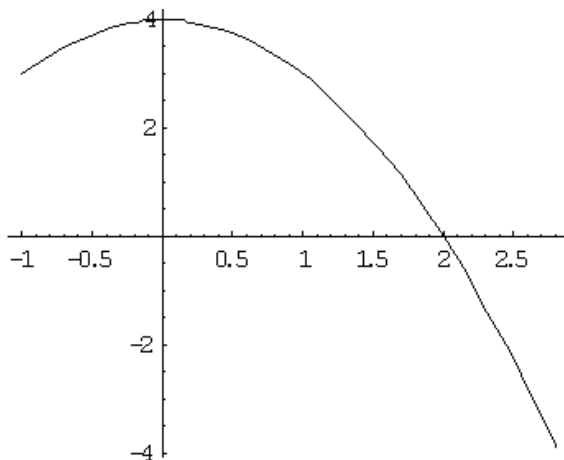
6. If  $f$  is continuous on the interval  $[a, b]$ , then  $\frac{d}{dx} \int_a^b f(x)dx =$

- (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  $\sin(x^2)$ .

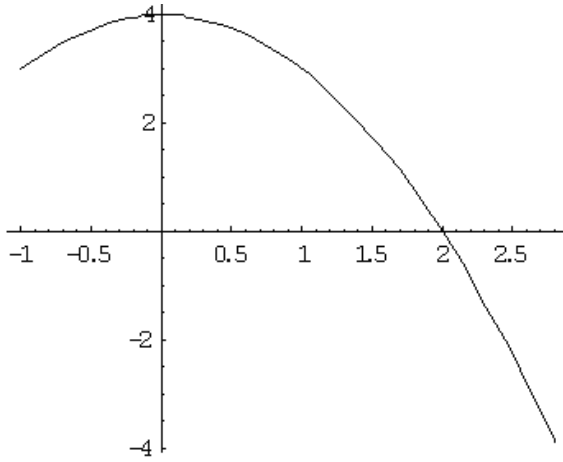
- (a) True, and I am very confident
- (b) True, but I am not very confident
- (c) False, but I am not very confident
- (d) False, and I am very confident

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

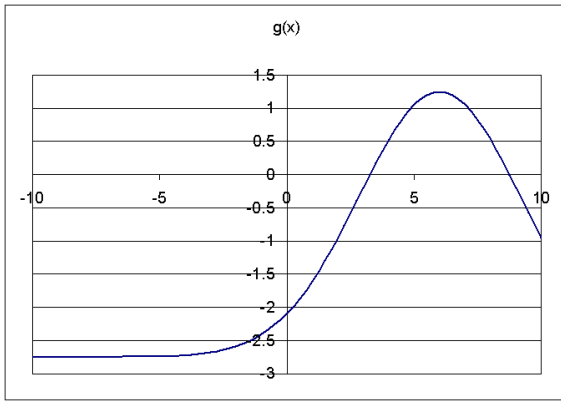


- (a) increasing and concave up.
- (b) increasing and concave down.
- (c) decreasing and concave up.
- (d) decreasing and concave down.

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  $g(x) = \int_3^x f(t)dt$ , and  $g(x)$  is plotted below. Where is  $f(x)$  positive?



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