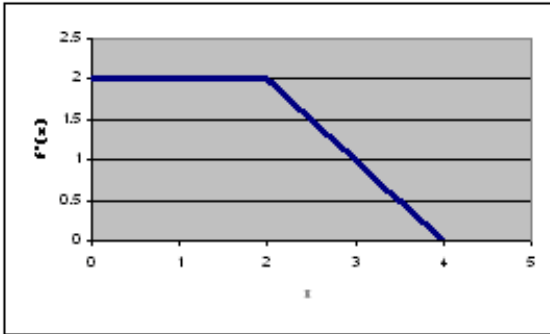


# Classroom Voting Questions: Calculus II

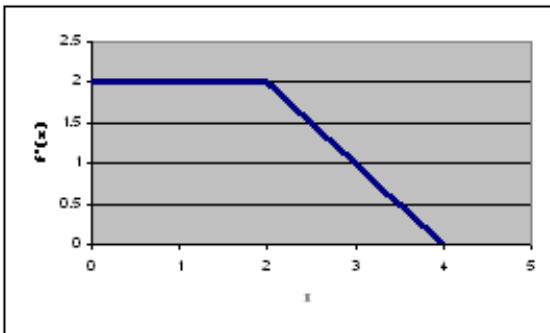
## Section 5.4 Theorems About Definite Integrals

1. The graph shows the *derivative* of a function  $f$ . If  $f(0) = 3$ , what is  $f(2)$ ?



- (a) 2
- (b) 4
- (c) 7
- (d) None of the above

2. The graph shows the *derivative* of a function  $f$ . Which is greater?



- (a)  $f(2) - f(0)$
- (b)  $f(3) - f(1)$
- (c)  $f(4) - f(2)$

3. Suppose  $f$  is a differentiable function. Then  $\int_0^5 f'(t)dt = f(5)$

- (a) Always

- (b) Sometimes
- (c) Never

4. If  $f$  is continuous and  $f(x) < 0$  for all  $x$  in  $[a, b]$ , then  $\int_a^b f(x)dx$

- (a) must be negative
- (b) might be 0
- (c) not enough information

5. Let  $f$  be a continuous function on the interval  $[a, b]$ . **True or False:** There exist two constants  $m$  and  $M$ , such that

$$m(b - a) \leq \int_a^b f(x)dx \leq M(b - a).$$

- (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. You are traveling with velocity  $v(t)$  that varies continuously over the interval  $[a, b]$  and your position at time  $t$  is given by  $s(t)$ . Which of the following represent your average velocity for that time interval:

I.

$$\frac{\int_a^b v(t)dt}{b - a}$$

II.

$$\frac{s(b) - s(a)}{b - a}$$

III.  $v(c)$  for at least one  $c$  between  $a$  and  $b$

- (a) I, II, and III
- (b) I only
- (c) I and II only
- (d) II only
- (e) II and III only

7. **True or False:**  $\int_0^2 f(x)dx = \int_0^2 f(t)dt$
- (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. **True or False:** If  $a = b$  then  $\int_a^b f(x)dx = 0$ .
- (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
9. **True or False:** If  $a \neq b$  then  $\int_a^b f(x)dx \neq 0$ .
- (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
10. **True or False:** If  $a \neq b$  and if  $\int_a^b f(x)dx = 0$ , then  $f(x) = 0$ .
- (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
11. **True or False:** If  $a \neq b$  and if  $\int_a^b |f(x)|dx = 0$ , then  $f(x) = 0$ .
- (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

12. **True or False:** If  $\int_0^2 f(x)dx = 3$  and  $\int_2^4 f(x)dx = 5$ , then  $\int_0^4 f(x)dx = 8$ .
- (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
13. Given that  $\int_0^2 f(x)dx = 3$  and  $\int_2^4 f(x)dx = 5$ , what is  $\int_0^2 f(2x)dx$ ?
- (a) 3/2
  - (b) 3
  - (c) 4
  - (d) 6
  - (e) 8
  - (f) Cannot be determined
14. **True or False:** If  $\int_0^2 (f(x) + g(x))dx = 10$  and  $\int_0^2 f(x)dx = 3$ , then  $\int_0^2 g(x)dx = 7$ .
- (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
15. **True or False:**  $\int_1^2 f(x)dx + \int_2^3 g(x)dx = \int_1^3 (f(x) + g(x))dx$ .
- (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
16. **True or False:** If  $f(x) \leq g(x)$  for  $2 \leq x \leq 6$ , then  $\int_2^6 f(x)dx \leq \int_2^6 g(x)dx$ .
- (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

17. **True or False:** If  $\int_2^6 f(x)dx \leq \int_2^6 g(x)dx$ , then  $f(x) \leq g(x)$  for  $2 \leq x \leq 6$ .

- (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