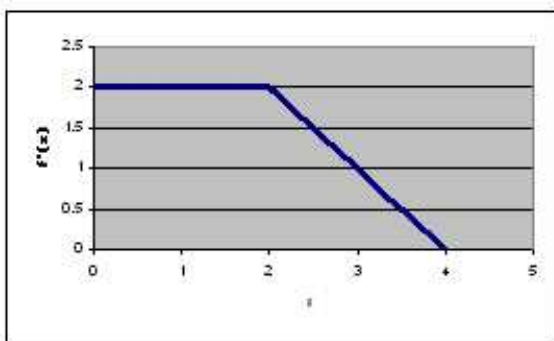


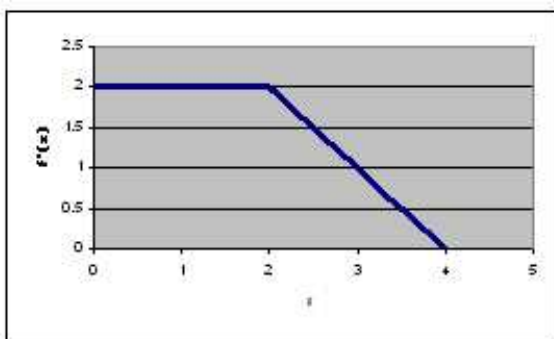
Classroom Voting Questions: Calculus II

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

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

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:** $\int_0^2 f(x)dx = \int_0^2 f(t)dt$

8. **True or False:** If $a = b$ then $\int_a^b f(x)dx = 0$.

9. **True or False:** If $a \neq b$ then $\int_a^b f(x)dx \neq 0$.
10. **True or False:** If $a \neq b$ and if $\int_a^b f(x)dx = 0$.then $f(x) = 0$.
11. **True or False:** If $a \neq b$ and if $\int_a^b |f(x)|dx = 0$.then $f(x) = 0$.
12. **True or False:** If $\int_0^2 f(x)dx = 3$ and $\int_2^4 f(x)dx = 5$, then $\int_0^4 f(x)dx = 8$.
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 $\int_0^2 g(x)dx = 7$.
15. **True or False:** $\int_1^2 f(x)dx + \int_2^3 g(x)dx = \int_1^3 (f(x) + g(x))dx$.
16. **True or False:** If $f(x) \leq g(x)$ for $2 \leq x \leq 6$, then $\int_2^6 f(x)dx \leq \int_2^6 g(x)dx$.
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 $2 \leq x \leq 6$.