

Classroom Voting Questions: Calculus II

Section 6.2 Constructing Antiderivatives Analytically

- True or False:** If f is continuous on the interval $[a, b]$, then $\int_a^b f(x)dx$ is a number (rather than a function).
 - True, and I am very confident
 - True, but I am not very confident
 - False, but I am not very confident
 - False, and I am very confident

- $\int (x^3 + 5)dx =$
 - $3x^2$
 - $3x^2 + 5$
 - $\frac{x^4}{4} + 5$
 - $\frac{1}{4}x^4 + 5x$
 - None of the above

- $\int \sin x dx =$
 - $\sin x + C$
 - $\cos x + C$
 - $-\sin x + C$
 - $-\cos x + C$
 - None of the above

- $\int x \sin x dx =$
 - $\cos x + C$
 - $\frac{1}{2}x^2(-\cos x) + C$
 - $x \cos x + C$
 - $\frac{1}{2}x^2 \sin x + C$
 - Cant do with what we know right now

5. $\int 5e^x dx =$

- (a) $5e^x + C$
- (b) $e^x + C$
- (c) $5xe^x + C$
- (d) $\frac{5e^{x+1}}{x+1} + C$
- (e) None of the above

6. $\int \sqrt{x} dx =$

- (a) $\frac{1}{2}x^{-1/2} + C$
- (b) $\frac{2}{3}x^{3/2} + C$
- (c) $\frac{3}{2}x^{3/2} + C$
- (d) $\frac{3}{2}x^{2/3} + C$
- (e) Can't do with what we know right now

7. $\int \sqrt{x^3} dx =$

- (a) $x^{3/2} + C$
- (b) $\frac{5}{2}x^{5/2} + C$
- (c) $\frac{3}{2}x^{1/2} + C$
- (d) $\frac{2}{5}x^{5/2} + C$
- (e) $\frac{3}{5}x^{5/3} + C$
- (f) None of the above

8. $\int \frac{7}{x^5} dx =$

- (a) $-\frac{7}{4}x^{-4} + C$
- (b) $7x^{-5} + C$
- (c) $-\frac{7}{6x^6} + C$
- (d) $\frac{7}{4x^4} + C$
- (e) None of the above

9. What is $\int_1^5 3 dt$?

- (a) 3

- (b) 4
- (c) 12
- (d) 15
- (e) 16

10. What is $\int \frac{5}{x^2} dx$?

- (a) $-\frac{5}{x} + C$
- (b) $\frac{5}{x^2} + C$
- (c) $-\frac{10}{x^3} + C$
- (d) $\frac{30}{x^4} + C$

11. $\int \frac{3}{x} dx =$

- (a) $-\frac{3}{2}x^{-2} + C$
- (b) $3 \ln x + C$
- (c) $\frac{3}{x^2} + C$
- (d) $3x^{-1} + C$
- (e) None of the above

12. An antiderivative of $6x^2$ is

- (a) $2x^3$
- (b) $2x^3 + 5$
- (c) $2x^3 + 18$
- (d) $2x^3 - 6$
- (e) All of the above

13. Which of the following is an antiderivative of $y(x) = 3 \sin(x) + 7$?

- (a) $g(x) = 3 \cos(x)$
- (b) $g(x) = 3 \cos(x) + 7$
- (c) $g(x) = 3 \cos(x) + 7x$
- (d) $g(x) = -3 \cos(x) + 7x$

14. **True or False:** If $F(x)$ is an antiderivative of $f(x)$ and $G(x) = F(x) + 2$, then $G(x)$ is an antiderivative of $f(x)$.
- (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
15. Water is flowing out of a reservoir at a rate given by $f(t) = 5000 + 50t + 5t^2$, where t is in days and f is in gallons per day. How much water flows out of the reservoir during the first week?
- (a) 572 gallons
 - (b) 5,000 gallons
 - (c) 5,595 gallons
 - (d) 35,000 gallons
 - (e) 36,797 gallons
 - (f) None of the above
16. Trucks are driving over a bridge at a rate given by the function $b(t) = 30 \cos(t) + 70$, where t is in hours from noon and b is in trucks per hour. How many trucks drive across the bridge between 3pm and 6pm?
- (a) 13 trucks
 - (b) 210 trucks
 - (c) 197 trucks
 - (d) 269 trucks
17. We know that $\frac{dy}{dx} = x^2$ and that $x(1) = 4$. What is the function $y(x)$?
- (a) $y = \frac{1}{3}x^3$
 - (b) $y = \frac{1}{3}x^3 + 3\frac{2}{3}$
 - (c) $y = \frac{1}{3}x^3 + 4$
 - (d) $y = x^2 + 3$
 - (e) None of the above