Calc AB Sample Test I -- Part A
Multiple Choice, NO Calculators

Name: _____
Period: _____

***In This Test:*** **Unless otherwise specified, the domain of a function *f* is assumed to be the set of all real numbers *x* for which f(*x*) is a real number.**

1. If $f(x)=\dfrac{x^2-9}{x+3}$ is continuous at $x = -3$, then $f(-3) =$

a. 3 b. –3 c. 0 d. 6 e. –6

2. If $x > 0$, $\int x^{-\frac{1}{3}}dx =$

a. $\dfrac{2}{3}x^{\frac{2}{3}}+C$ b. $-\dfrac{1}{3}x^{-\frac{4}{3}}+C$ c. $-\dfrac{3}{2}x^{\frac{2}{3}}+C$

d. $\dfrac{3}{2}x^{\frac{2}{3}}+C$ e. $-\dfrac{3}{4}x^{-\frac{4}{3}}+C$

3. If $f(x)=e^{\sin x}$, how many zeros does $f'(x)$ have on the closed interval $[0,2\pi]$?

a. 1 b. 2 c. 3 d. 4 e. 5

4. $\lim\limits_{x\to\infty}\dfrac{10^8x^5+10^6x^4+10^4x^2}{10^9x^6+10^7x^5+10^5x^3} =$

a. 0 b. 1 c. –1 d. $\dfrac{1}{10}$ e. $-\dfrac{1}{10}$

5. The graph of which function has $y = -1$ as an asymptote?

a. $y=e^{-x}$ b. $y=\dfrac{-x}{1-x}$ c. $y=\ln(x+1)$

d. $y=\dfrac{x}{x+1}$ e. $y=\dfrac{x}{1-x}$

6. If $f(x)=\sqrt{4\sin x+2}$, then $f'(0) =$

a. –2 b. 0 c. $\sqrt{2}$ d. $\dfrac{\sqrt{2}}{2}$ e. 1

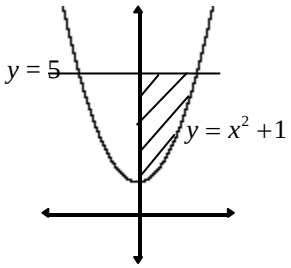
7. The equation of the tangent line to the curve $x^2+y^2=169$ at the point $(5,-12)$ is

a. $5y-12x=-120$ b. $5x-12y=119$
c. $5x-12y=169$ d. $12x+5y=0$
e. $12x+5y=169$

8. If $f(x)=x-1$ and $g(x)=x^2+1$, then $f(g(x))=g(f(x))$ when $x =$

a. –½ b. ½ c. –1 d. 1 e. 0

9. For the figure given, the area of the shaded region is




a. $\dfrac{14}{3}$ b. $\dfrac{16}{3}$
c. $\dfrac{28}{3}$ d. $\dfrac{32}{3}$
e. $\dfrac{65}{3}$

10. $\int\dfrac{1}{\sqrt{4-x^2}}dx =$

a. $\arcsin\dfrac{x}{2}+C$ b. $2\sqrt{4-x^2}+C$ c. $\arcsin x+C$

d. $\sqrt{4-x^2}+C$ e. $\dfrac{1}{2}\arcsin\dfrac{x}{2}+C$

11. If the graph of $f(x)=2x^2+\dfrac{k}{x}$ has a point of inflection at $x = -1$, then the value of *k* is

a. 1 b. –1 c. 2 d. –2 e. 0

12. The graph of $y=\sqrt[3]{x^2+1}$ is symmetric with respect to which of the following?

I. the *x* – axis
II. the *y* – axis
III. the origin

a. I only b. II only c. III only
d. II and III only e. I, II, and III

13. $\int\sin(3x+4)dx =$

a. $-\dfrac{1}{3}\cos(3x+4)+C$ b. $-\cos(3x+4)+C$
c. $-3\cos(3x+4)+C$ d. $\cos(3x+4)+C$
e. $\dfrac{1}{3}\cos(3x+4)+C$

14. $\dfrac{d}{dx}\left(e^{3\ln x}\right) =$

a. . $e^{3\ln x}$ b. $\dfrac{e^{3\ln x}}{x}$ c. $x^3$ d. $3x^2$ e. 3

15. For what values of $x$ is the graph of $y = \frac{2}{4-x}$ concave downward?

a. No values of $x$ b. $x < 4$ c. $x > -4$
d. $x < -4$ e. $x > 4$

16. A particle moves along the $x$ – axis in such a way that its position at time $t$ is given by $x(t) = \frac{1-t}{1+t}$. What is the acceleration of the particle at time $t$ = 0?

a. –3/5 b. –4 c. 4 d. 2 e. –2

17. Suppose $f(x) = \ln 3x$ and $f^{-1}(x)$ denotes the inverse of $f$. Then $\int f^{-1}(x)dx =$

a. $3e^x + C$ b. $\frac{1}{3}e^x + C$ c. $\frac{1}{x} + C$
d. $\frac{1}{3x} + C$ e. $\frac{1}{3}e^{3x} + C$

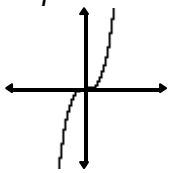
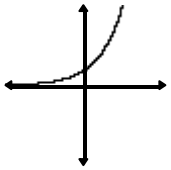
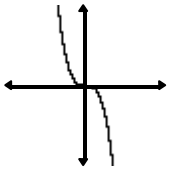
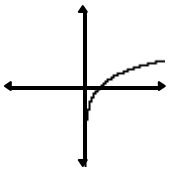
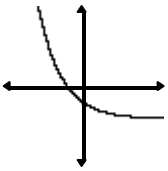
18. If $y = x^{(x^3)}$ for $x > 0$, then $\frac{dy}{dx} =$

a. $x^3 \cdot x^{(x^3-1)}$ b. $4x^3$ c. $x^2 + 3x^2 \ln x$
d. $x^{(x^3+2)}(1+3\ln x)$ e. $3x^{(x^3+2)} \ln x$

19. A particle moves on the $x$ – axis so that at any time $t$ its velocity $v(t) = \sin 2t$ subject to the condition $x(0) = 0$ where $x(t)$ is the position function. Which of the following is the expression for $x(t)$?

a. $\cos 2t + \frac{1}{2}$ b. $-\frac{1}{2}\sin 2t + \frac{1}{2}$
c. $-\frac{1}{2}\cos 2t$ d. $-\frac{1}{2}\cos 2t + \frac{1}{2}$
e. $-\frac{1}{2}\cos 2t - \frac{1}{2}$

20. If, for all values of $x$, $f'(x) < 0$ and $f''(x) >$), which of the following curves could be part of the graph of $f$?

a.  b.  c. 
d.  e. 

21. If $\int x\sec^2 x dx = f(x) + \ln|\cos x| + C$, then $f(x) =$

a. $\tan x$ b. $\frac{1}{2}x^2$ c. $x\tan x$
d. $x^2 \tan x$ e. $\tan^2 x$

22. If $\int_0^6 (x^2 - 2x + 2)dx$ is approximated by three inscribed rectangles of equal width on the $x$ – axis, then the approximation is

a. 24 b. 26 c. 28 d. 48 e. 76

23. $\int_0^3 \frac{x}{x+1}dx =$

a. 2 ln2 b. 6 ln2 c. 3 – 2 ln2
d. 3 + 2 ln2 e. 3 + ln3

24. The maximum value of $f(x) = 2x^3 - 9x^2 + 12x - 1$ on [-1,2] is

a. 0 b. 1 c. 2 d. 3 e. 4

25. Let $f(x)$ be the function defined by $f(x) = \begin{cases} x, & x \le 0 \\ x+1, & x > 0 \end{cases}$. The value of $\int_{-2}^{1} xf(x)dx =$

a. $\frac{3}{2}$ b. $\frac{5}{2}$ c. $\frac{7}{2}$ d. $\frac{11}{2}$ e. 3

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|---|---|---|---|---|
| 1. E | 7. C | 13. A | 19. D | 25. C |
| 2. D | 8. D | 14. D | 20. E | |
| 3. B | 9. B | 15. E | 21. C | |
| 4. A | 10. A | 16. C | 22. B | |
| 5. E | 11. C | 17. B | 23. C | |
| 6. C | 12. B | 18. D | 24. E | |