Chapter 5 Test
Calculus

1. $\displaystyle \int x^4 \sqrt[5]{x^5-2}\, dx =$

   A) $\dfrac{\left(x^5-2\right)^{6/5}}{6}\left(5x^4-2\right)+C$

   D) $\dfrac{\left(x^5-2\right)}{6}+C$

   B) $\dfrac{\left(x^5-2\right)^{6/5}}{12}+C$

   E) $\dfrac{\left(x^5-2\right)^{6/5}}{6}+C$

   C) $\dfrac{\left(x^5+2\right)^{6/5}}{6}+C$

2. $\displaystyle \int_0^4 x\sqrt{x+7}\, dx =$

   A) 48.643   B) 34.571   C) 2.933   D) 24.843   E) 9.728

3. $\displaystyle \int_0^4 x^6 dx =$

   A) 4,096   B) $\dfrac{2,048}{3}$ C) 0   D) $\dfrac{16,384}{7}$ E) 16,384

4. $\displaystyle \int_{-6}^{6} x\sqrt{36-x^2}\, dx =$

   A) 12   B) –36   C) 36   D) 0   E) 72

5. Find the average value of $f(x)=\dfrac{1}{x}$ over the interval [1, 4]. Approximate value to three decimal places.

   A) 1.386   B) 18.199   C) 1.406   D) 0.462   E) 0.250

6. $\displaystyle \int 7x^{4/5} dx =$

   A) $\dfrac{35}{4}x^{9/5}+C$ B) $\dfrac{35}{9}x^{9/5}+C$ C) $\dfrac{5}{9}x^{9/5}+C$ D) $\dfrac{7}{9}x^{9/5}+C$ E) $\dfrac{4}{5x^{1/5}}+C$

7. $\displaystyle \int 7x^5 dx =$

   A) $\dfrac{x^5}{5}+C$ B) $\dfrac{7x^5}{6}+C$ C) $\dfrac{7x^6}{6}+C$ D) $\dfrac{x^6}{6}+C$ E) $\dfrac{7x^5}{5}+C$

8. $\int \dfrac{7x^4 + 8x^3 + 8x^2}{x^2}\, dx =$

A) $14x^2 + 8x + C$

B) $21x^3 + 16x^2 + 8x + C$

C) $21x^3 - 16x^2 - 8x + C$

D) $\dfrac{\dfrac{7x^3}{3} + \dfrac{8x^2}{2} + 8x}{3x^3} + C$

E) $\dfrac{7x^3}{3} + \dfrac{8x^2}{2} + 8x + C$

9. $\int_4^9 3\, dx =$

A) 23   B) 27   C) 39   D) 15   E) 5

10. $\int 5x^{-3}\, dx =$

A) $\dfrac{5}{2x^2} + C$ B) $-\dfrac{5}{2x^4} + C$ C) $-\dfrac{5}{2x^2} + C$ D) $-\dfrac{1}{2x^2} + C$ E) $-\dfrac{5}{2x^3} + C$

11. $\int_0^{\pi/5} 5\cos 10x\, dx =$

A) 1   B) -0.5   C) 0   D) 0.5   E) -0.866

12. Find the displacement of a particle if $v(t) = \sin t;\ \left[0, \dfrac{7\pi}{2}\right]$.

A) $\dfrac{7\pi}{2}$ B) 2   C) 1   D) π E) 0

13. $\int \dfrac{x}{\sqrt{5x^2 + 1}}\, dx =$

A) $\dfrac{\sqrt{5x^2 + 1}}{5} + C$

B) $\sqrt{5x^2 + 1} + C$

C) $\ln|x| + C$

D) $\ln\left|\sqrt{5x^2 + 1}\right| + C$

E) $\dfrac{5}{\sqrt{5x^2 + 1}} + C$

14. Find $y(x)$ if $\dfrac{dy}{dx} = x^8$ and $y(0) = 5$.

A) $\dfrac{x^9}{9} + 6$ B) $\dfrac{x^9}{9} + 5$ C) $\dfrac{x^8}{8} + 5$ D) $\dfrac{x^9 + 5}{9}$ E) $\dfrac{x^9}{9}$

15. Find the position at time $t = 3$ second of a particle if $v(t) = 2t - 8$; $s = 4$ when $t = 0$.

16. $\int \cos^3 x \, \sin x \, dx =$

    A) $-\dfrac{\cos^3 x}{3} + C$

    B) $-\dfrac{\cos^4 x}{4} + C$

    C) $-\dfrac{\tan^4 x}{4} + C$

    D) $\dfrac{\cos^4 x}{4} + C$

    E) $-\dfrac{\sin^4 x}{4} + C$

17. $\int 4x^3 \left(x^4 - 6 \right)^5 dx =$

    A) $\dfrac{\left(x^4 - 6 \right)^6}{6} + C$

    B) $\left(x^4 - 6 \right)^6 + C$

    C) $\dfrac{\left(x^4 - 6 \right)^5}{5} + C$

    D) $\dfrac{\left(x^4 + 6 \right)^6}{6} + C$

    E) $\dfrac{4x \left(x^4 - 6 \right)^6}{6} + C$

18. Find the area under the curve $y = x^2 - 4$ on [1, 4].
    A) 15   B) 5.333   C) 21   D) 9   E) 22

19. $\int \sqrt[3]{x} \, dx =$

    A) $-\dfrac{3}{4} x^{4/3} + C$ B) $3x^{1/3} + C$ C) $-\dfrac{1}{3x^{2/3}} + C$ D) $\dfrac{3}{4} x^{4/3} + C$ E) $\dfrac{1}{3x^{2/3}} + C$

20. Find $y(x)$ if $\dfrac{dy}{dx} = x^4 - 7$ and $y(0) = 5$.

    A) $\dfrac{x^4}{4} - 7x + 5$ B) $\dfrac{x^5}{5} - 7x$ C) $\dfrac{x^5}{5} - 7x + 12$ D) $\dfrac{x^5}{5} - 7x + 5$ E) $\dfrac{x^5}{5} - \dfrac{x}{7} + 5$

21. $\int_{\pi}^{2\pi} \dfrac{\pi}{8} \sin x \, dx =$

    A) 0.3927   B) 0.7854   C) –2   D) 0.1963   E) –0.7854

22. $\int_0^2 x^2 e^{x^3} \, dx =$

    A) 2,979.958   B) 993.653   C) 3,974.611   D) 2.130   E) 993.319

23. Find the average value of $f(x) = x^8$ over the interval $[-2, 2]$.

A) $\dfrac{1}{9}$ B) $\dfrac{10}{9}$ C) 0   D) 256   E) $\dfrac{256}{9}$

24. $\dfrac{d}{dx} \displaystyle\int_4^x \dfrac{2t}{\sin t}\, dt =$

A) $\dfrac{2x}{\sin x}$ B) $\dfrac{2x+4}{\sin x}$ C) $-\dfrac{2x}{\sin x}$ D) $\dfrac{2x}{\sin x}+4$ E) $\dfrac{2x-4}{\sin x}$

Answer Key

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