

Test #3 Review Exercise Answers

1. Absolute max: 1, Absolute min: $2 - 2 \ln 2$
2. Absolute max: $\frac{1}{2e}$, Absolute min: $-2e^4$
3. $2\sqrt{3}$ by 6
4. $2ab$
5. Volume: 4565.18 in^3 ; Dimensions: $13\frac{1}{6} \text{ in.}$ by $13\frac{1}{6} \text{ in.}$ by $26\frac{1}{3} \text{ in.}$
6. $\frac{4}{27}\pi r^2 h$
7. $\frac{32\pi}{3}$
8. 2 ft by 2 ft by $1\frac{2}{3} \text{ ft}$
9.
 - a) $6x^{4/3} - 2 \ln|x| + \frac{x^{10000}}{10000} - 20\sqrt{x} - \frac{1}{2x^2} + \frac{2}{5}x^{5/2} + C$
 - b) $-\frac{1}{3}\cos 3x + 2 \sec x + e^{-x} + \frac{3^x}{\ln 3} + 19x + C$
 - c) $2 \tan^{-1} x - 3 \sin^{-1} x + \cot x + C$
10. $s(t) = -3 \cos t + 2 \sin t + 2t + 3$
11. $s(t) = \frac{t^4}{12} - \frac{2}{3}t^3 + 3t^2 + \frac{211}{12}t$
12. $f(x) = 2e^x - 3 \sin x - \frac{2e^\pi - 2}{\pi}x - 2$
13.
 - a) $1 + \sqrt{2} + \sqrt{3} \approx 4.146$
 - b) $1 + \sqrt{2} + \sqrt{3} + 2 \approx 6.146$
 - c) $\sqrt{\frac{1}{2}} + \sqrt{\frac{3}{2}} + \sqrt{\frac{5}{2}} + \sqrt{\frac{7}{2}} \approx 5.384$
14.
 - a) 3.812
 - b) 4.987
 - c) 4.326
15.
 - a) 660 miles
 - b) 680 miles
16.
 - a) 18
 - b) $-\frac{8}{3}$

17.

- a) 6
- b) 11
- c) -8

18.

- a) 2
- b) $6\frac{1}{2}$ (or $\frac{13}{2}$)
- c) 2
- d) 0
- e) -3
- f) $9\frac{1}{2}$ (or $\frac{19}{2}$)

19.

- a) $19\frac{1}{2}$ (or $\frac{39}{2}$)
- b) $\pi + 6$

20.

- a) $-\frac{\sin^5(1/x)}{x^2}$
- b) $-(x^2 - 5)^{10}$
- c) $2 \tan^{-1} 2x - \frac{\tan^{-1} \sqrt{x}}{2\sqrt{x}}$

21.

- a) $\frac{769}{5}$ (or 153.8)
- b) $\frac{2-\sqrt{2}}{4}$
- c) $\sqrt{3}$
- d) $\frac{5\pi}{4}$
- e) $\frac{\pi^2}{9} - 1$
- f) $-\frac{1}{2} \ln \frac{1}{2}$ (or $\frac{1}{2} \ln 2$)
- g) $\frac{e^3 - 1}{3}$
- h) $\frac{9}{2}$ (or 4.5)
- i) $-\frac{2}{9(2x^3 + 3x)^3} + C$
- j) $-\frac{1}{2} e^{2 \cos x} + C$
- k) $\frac{3}{2} e^{x^2 + 2} + C$
- l) $-\frac{1}{2} x^2 e^{-2x} - \frac{1}{2} x e^{-2x} - \frac{1}{4} e^{-2x} + C$
- m) $\frac{x^3}{3} \ln x - \frac{x^3}{9} + C$
- n) $\frac{e^{2x} \sin x + 2e^{2x} \cos x}{5} + C$
- o) $\frac{1}{3} x(2x + 1)^{3/2} - \frac{1}{15} (2x + 1)^{5/2} + C$ (or $\frac{1}{10} (2x + 1)^{5/2} - \frac{1}{6} (2x + 1)^{3/2} + C$)
- p) $\frac{15}{8}$
- q) $\frac{6}{\ln 7}$
- r) $\frac{\pi}{4} - \frac{\ln 2}{2}$
- s) 0 (the integrand is an odd function)

22. 26 m