

Math 180 - 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. Volume: 4565.18 in^3 ; Dimensions: $13\frac{1}{6} \text{ in.}$ by $13\frac{1}{6} \text{ in.}$ by $26\frac{1}{3} \text{ in.}$

5. 2 ft by 2 ft by $1\frac{2}{3} \text{ ft}$

6.

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) $2 \tan^{-1} x - 3 \sin^{-1} x + \cot x + C$

7. $s(t) = -3 \cos t + 2 \sin t + 2t + 3$

8. $s(t) = \frac{t^4}{12} - \frac{2}{3}t^3 + 3t^2 + \frac{211}{12}t$

9. $f(x) = 2e^x - 3 \sin x - \frac{2e^\pi - 2}{\pi}x - 2$

10.

a) $1 + \sqrt{2} + \sqrt{3} \approx 4.146$

b) $1 + \sqrt{2} + \sqrt{3} + 2 \approx 6.146$

c) $\sqrt{\frac{1}{2}} + \sqrt{\frac{3}{2}} + \sqrt{\frac{5}{2}} + \sqrt{\frac{7}{2}} \approx 5.384$

11.

a) 3.812

b) 4.987

c) 4.326

12.

a) 660 miles

b) 680 miles

13.

a) 18

b) $-\frac{8}{3}$

14.

a) 6

b) 11

c) -8

15.

a) 2

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

16.

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

17.

- 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) $-\frac{1}{2}x^2e^{-2x} - \frac{1}{2}xe^{-2x} - \frac{1}{4}e^{-2x} + C$
- 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 $\frac{1}{10}(2x+1)^{5/2} - \frac{1}{6}(2x+1)^{3/2} + C$)

18. 26 m