

Calculus II Spring 2017 Final Exam Answers

1a. 6

1b. $\frac{1}{4036} \sin^{2018}(2x) - \frac{1}{4040} \sin^{2020}(2x) + C$

1c. $\frac{1}{4} x^4 \ln(x) - \frac{1}{16} x^4 + C$

1d. $\ln \left| \frac{\sqrt{9+x^2}}{3} + \frac{x}{3} \right| + C$

1e. $\frac{2}{7} \ln|x + 6| + \frac{5}{7} \ln|x - 1| + C$

1f. $\frac{\pi}{4}$

2a. $V = \int_0^1 2\pi y(2\sqrt{y} - y) dy$ or $V = \int_0^1 \pi \left(x^2 - \left(\frac{x^2}{4} \right)^2 \right) dx + \int_1^2 \pi \left(1^2 - \left(\frac{x^2}{4} \right)^2 \right) dx$

2b. $P = \int_0^1 \sqrt{1+1^2} dx + \int_1^2 \sqrt{1+0^2} dx + \int_0^2 \sqrt{1 + \left(\frac{x}{2} \right)^2} dx = \sqrt{2} + 1 + \int_0^2 \sqrt{1 + \frac{1}{4}x^2} dx$

3a. diverges

3b. converges

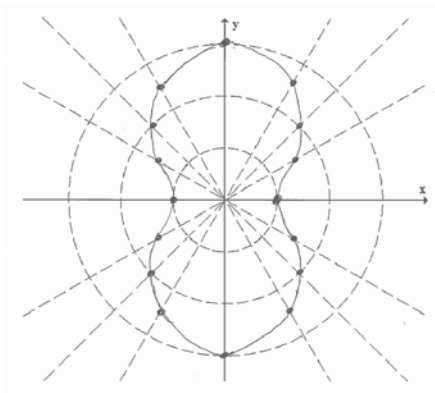
3c. diverges

3d. converges

4. $-\frac{1}{3}, \frac{1}{3}, \left[-\frac{2}{3}, 0 \right)$

5. $21 - 36(x + 2) + 25(x + 2)^2 - 8(x + 2)^3 + (x + 2)^4$

6. $\sum_{n=1}^{\infty} \frac{(-1)^{n+1} 9^n}{n} \cdot x^{2n}, |x| \leq \frac{1}{3}$



7.