

Review information for Calculus III Test I.

The test will cover sections 12.1–12.10. Here is a list of useful problems to review in the Chapter Review on pages 822–824. For the most part, the problems on the test will be very similar to these.

True-False: 1, 2, 4–13, 16–18.

Exercises: 1–6, 11–14, 16–18, 21, 23–27, 34, 40–42, 47–51, 55, 57ac, 59.

In general, possible problem types include the following:

- Determine whether the sequence is convergent or divergent. If it is convergent, find its limit (cf. #1–8).
- Determine whether the series is conditionally convergent, absolutely convergent, or divergent (cf. #11–26).
- Find the sum of the series (cf. #27–31).
- Find the radius of convergence and interval of convergence for the series (cf. #34, 40–44).
- Find the Taylor series for the function and its radius of convergence (cf. #47–54).
- Use series to find integrals and/or limits (cf. #55, 59).
- Estimate the function at a point using a Taylor approximation, and estimate the remainder (cf. #57).

Answers to the odd problems are in the back of the textbook. Answers to the even problems are below.

True-False

2. False. **4.** True. **6.** True. **8.** True. **10.** True. **12.** True. **16.** True. **18.** True.

Exercises

2. Convergent, 0. **4.** Divergent. **6.** Convergent, 0. **12.** Diverges. **14.** Converges. **16.** Diverges. **18.** Converges. **24.** Converges absolutely. **26.** Diverges.

34. $e^{-1} < x < e$. **40.** $[-5, 5]$. **42.** $(-\infty, \infty)$. **48.** $x^2 - \frac{x^6}{3} + \frac{x^{10}}{5} - \frac{x^{14}}{7} + \frac{x^{18}}{9} - \dots$

with $R = 1$. **50.** $x + 2x^2 + \frac{4x^3}{2!} + \frac{8x^4}{3!} + \frac{16x^5}{4!} + \dots$ with $R = \infty$.