

Math 1042 Review Answer Key – Test 2

Section 7.2

25. $\frac{4}{3}$

Section 7.3

14. $\operatorname{arcsec}(x) + \frac{\sqrt{x^2 - 1}}{x^2} + C$

16. $\frac{-\sqrt{x^2 + 1}}{x} + C$

Section 7.7

4. 4 13. 0 47. Converges. (Direct comparison with $\int_1^\infty \frac{1}{x^3} dx$)

49. Diverges. (Compare with $\int_2^\infty \frac{1}{\sqrt{x}} dx$)

55. Diverges. (Compare with $\int_\pi^\infty \frac{1}{x} dx$) 67. 1

Chapter 7 Practice Exercises

12. $-2 \ln|x| + \frac{1}{x} + 2 \ln|x - 1| + C$

15. $4 \ln|x| - \frac{1}{2} \ln(x^2 + 1) + 4 \arctan x + C$

22. $x - \ln|x| + \ln|x - 1| + C$

37. $\frac{-\cos^5 x}{5} + \frac{\cos^7 x}{7} + C$

40. $\frac{\sec^5 x}{5} - \frac{\sec^3 x}{3} + C$

63. Diverges. (Limit comparison with $\int_6^\infty \frac{1}{\theta} d\theta$)

Section 8.2

14. $2 + \frac{4}{5} + \frac{8}{25} + \frac{16}{5} + \dots = \frac{10}{3}$ (Geometric with $a = 2$ and $r = 2/5$)

43. Converges for $-1 < x < 3$ to $s = \frac{6}{3 - x}$ (Geometric with $a = 3$ and $r = \frac{x - 1}{2}$)

45. Converges for $-1/2 < x < 1/2$ to $s = \frac{1}{1 - 2x}$ (Geometric with $a = 1$ and $r = 2x$)

Section 8.3

3. Diverges (by n th Term Test for Divergence)

6. Converges (multiple of convergent p -series; $p = 3/2 > 1$)

Section 8.4

4. Converges (compare to $\sum \frac{1}{n^2}$) 8. Converges (compare to $\sum \frac{1}{n^{3/2}}$)

20. Converges (compare to $\sum \frac{1}{n^{3/2}}$)

Section 8.5

12. Converges (root test) 15. Diverges (compare to $\sum \frac{1}{n}$)
21. Converges (ratio test) 26. Diverges (ratio test or root test)

Section 8.6

17. Converges conditionally 18. Converges absolutely
19. Diverges (by test for divergence)

Chapter 8 Practice Exercises

23. $\frac{e}{e-1}$ (Geometric with $a = 1$, $r = 1/e$)
24. $\frac{-3}{5}$ (Geometric with $a = -3/4$, $r = -1/4$)
27. Converges conditionally 30. Converges absolutely (integral test)
37. Converges absolutely (ratio test) 38. Converges absolutely (root test)