Assignment 9.3 #26

Using the La Grange Error Bound formula, we get the maximum error when $c = 0.1$. Therefore, *error bound* $\leq 1.694 \times 10^{-4}$

Even Answers 9.4

2. Diverges by the Test for Divergence

4. Converges; geometric series with $r < 1$

6. Diverges by the Test for Divergence

8. Converges by the Ratio Test

10. Diverges by the Test for Divergence

12. Diverges by the Ratio Test

14. Converges by the Ratio Test

16. Converges by the Ratio Test

20. Geometric series which converges for $|x + 5| < 1$ so the radius of convergence is 1

22. Radius of convergence is $\frac{1}{3}$

24. Radius of convergence is 1

26. Radius of convergence is ∞

28. Radius of convergence is 4

30. Radius of convergence is 0

32. Radius of convergence is $\frac{1}{4}$

34. Radius of convergence is $\sqrt{2}$

36. Interval of convergence is $-4 < x < 2$
Sum = $-\frac{1}{x^2 + 2x - 8}$

46. $S = 3$

48. $S = 1$

Even Answers 9.5

2. Diverges by p-series test

4. Diverges by the Integral Test

6. Converges because it is a geometric series

8. Diverges by Direct Comparison to $\sum_{n=1}^{\infty} \frac{1}{e^n}$

10. Converges by Limit Comparison Test to $\sum_{n=1}^{\infty} \frac{1}{n^2}$

12. Converges by Alternating Series Test

14. Converges by Alternating Series Test

16. Diverges by Limit Comparison to $\sum_{n=1}^{\infty} \frac{1}{n}$

18. Converges Conditionally

20. Converges Conditionally

22. Converges Absolutely

24. Converges Absolutely

26. Converges Conditionally

28. (a) (–6, –4) (b) (–6, –4) (c) None

30. (a) $\left[\frac{1}{3}, 1\right)$ (b) $\left(\frac{1}{3}, 1\right)$ (c) At $x = \frac{1}{3}$

32. (a) (–1, 1) (b) (–1, 1) (c) None

34. (a) (b) and (c) All reals

36. (a) [–4, 4) (b) (–4, 4) (c) At $x = -4$

38. (a) Only at $x = 4$ (b) At $x = 4$ (c) None

40. (a) $\left[1, \frac{3}{2}\right)$ (b) $\left[1, \frac{3}{2}\right]$ (c) None

42. (a) $\left(\frac{1}{e}, 1\right)$ (b) $\left(\frac{1}{e}, 1\right)$ (c) None

50. (a) $\ln(x+1) = x - \frac{x^2}{2} + \frac{x^3}{3} \ldots (-1)^{n+1} \frac{x^n}{n}$

(b) $-1 < x \leq 1$

(c) let $x = \frac{1}{2}$, truncation error $< \frac{1}{384}$

(d) $\frac{1}{2}\ln(1 + x^2)$

52. (a) Converges by Direct Comparison

(b) Diverges by Integral Test

(c) Diverges by Direct Comparison with (b)

54. $\arctan(x) = \sum_{n=0}^{\infty} (-1)^{n+1} \frac{x^{2n+1}}{2n+1}$

Converges for $x = \pm 1$ by the Alternating Series Test