

Answers to Sample Exam 3

- 1.) e
- 2.) b
- 3.) d
- 4.) c
- 5.) e
- 6.) c
- 7.) b
- 8.) b
- 9.) d
- 10.) a
- 11.) a
- 12.) a,c,e
- 13.) b
- 14.) Diverges by Limit Comparison Test.
- 15.) Diverges by Test for Divergence.
- 16.) Radius of Convergence: 2; Interval of Convergence: $(1, 5]$.

$$17.) \sum_{n=1}^{\infty} (-1)^{n+1} 2n x^{2n-1} \text{ or } \sum_{n=0}^{\infty} (-1)^n (2n+2) x^{2n+1}.$$

$$18.) \sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n} (x-1)^n$$

$$19.) \cos \theta = \frac{10}{13\sqrt{2}}$$

$$20.) \text{ Vector Projection: } \left\langle -\frac{9}{14}, -\frac{27}{14}, -\frac{9}{7} \right\rangle$$

$$\text{Scalar Projection: } -\frac{9}{\sqrt{14}}$$

$$21.) s_3 = \sum_{n=0}^3 \frac{(-1)^n}{n!(2n+1)} = \frac{26}{35}$$

22.) The series converges by the Integral Test. The sum of the first 5 terms is

$$s_6 = \sum_{n=2}^7 \frac{1}{n(\ln n)^3} = \frac{1}{2(\ln 2)^3} + \frac{1}{3(\ln 3)^3} + \dots + \frac{1}{6(\ln 6)^3}.$$

Now an upper bound on the remainder is $R_6 \leq \frac{1}{2(\ln 6)^2}$.