

**“Show work” for full credit problems**

1. Find the sum of the series  $\sum_{n=2}^{\infty} \frac{3}{\sqrt{10}^n}$  if it is convergent; otherwise, show that it is divergent.

2. Determine whether the series  $\sum_{n=2}^{\infty} \frac{4}{n \ln n}$  is convergent.

3. Determine whether the series  $\sum_{n=1}^{\infty} \frac{4\sqrt{n} + n}{n^2}$  is convergent.

4. Determine whether the series  $\sum_{n=1}^{\infty} \frac{4 + 2^{2n}}{2 + 5^n}$  is convergent.

5. Write the series

$$\frac{1}{2} - \frac{2}{5} + \frac{3}{10} - \frac{4}{17} + \frac{5}{26} -$$

in the form  $\sum_{n=1}^{\infty} (-1)^{n-1} b_n$ . Then determine whether it is absolutely convergent, conditionally convergent, or divergent.

6. Find the radius of convergence and interval of convergence of the series

$$\sum_{n=1}^{\infty} \frac{x^n}{n9^n}.$$

7. Find a power series representation for the function

$$f(x) = \frac{x}{4 + x^2}.$$

8. Find the Taylor series of the function about the given point.

$$f(x) = 5e^{-\frac{2}{5}x}, \quad a = 5.$$