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## More Series Practice Problems

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Determine whether each of the following series is convergent or divergent.

1. 
$$\sum_{n=1}^{\infty} \frac{n}{n^3 + 1}$$

2. 
$$\sum_{n=1}^{\infty} \frac{n^3}{5^n}$$

3. 
$$\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$$

4. 
$$\sum_{n=1}^{\infty} \ln \left( \frac{n}{3n + 1} \right)$$

5. 
$$\sum_{n=1}^{\infty} \frac{(-5)^{2n}}{n^2 9^n}$$

6. 
$$\sum_{n=1}^{\infty} \frac{\cos^2 n}{n^2 + 1}$$

7. 
$$\sum_{n=1}^{\infty} \frac{4 + 3^n}{2^n}$$

8. 
$$\sum_{n=0}^{\infty} \frac{(-10)^n}{n!}$$

9. 
$$\sum_{n=1}^{\infty} \frac{10^n}{(n + 1)4^{2n+1}}$$

10. 
$$\sum_{n=1}^{\infty} \frac{n^2}{5^n}$$

11. 
$$\sum_{n=1}^{\infty} (-1)^{n-1} \frac{2^n}{n^4}$$

12. 
$$\sum_{n=1}^{\infty} \frac{n^2 - 1}{3n^4 + 1}$$

Determine whether each of the following series is convergent or divergent. If the series is convergent, find its sum.

1. 
$$\sum_{n=1}^{\infty} \frac{2^{2n+1}}{5^n}$$

2. 
$$\sum_{n=1}^{\infty} \left( \frac{3}{n(n+1)} + \frac{1}{2^n} \right)$$

3. 
$$\sum_{n=0}^{\infty} \frac{\pi^n}{3^{n+1}}$$

4. 
$$\sum_{n=1}^{\infty} \frac{(-6)^{n-1}}{5^{n-1}}$$

5. 
$$\sum_{n=0}^{\infty} 5 \left( \frac{2}{3} \right)^n$$

6. 
$$\sum_{n=1}^{\infty} (\cos 1)^n$$

7. 
$$\sum_{n=1}^{\infty} \frac{3}{n(n+3)}$$

8. 
$$\sum_{n=1}^{\infty} \ln \left( \frac{n}{n+1} \right)$$