Find whether the series is convergent or divergent. If it is convergent, find the sum.

1. \[ \sum_{n=1}^{\infty} \left( \frac{4}{5} \right)^{n-1} + 6 \cdot \left( \frac{2}{3} \right)^{n-1} - 4 \cdot \left( \frac{1}{8} \right)^{n-1} \]

2. \[ \sum_{n=1}^{\infty} \frac{3 \cdot 2^{2n-2}}{5^{n-1}} \]

3. \[ \sum_{n=1}^{\infty} \frac{e^n}{n^2} \]
4. \[ \sum_{n=1}^{\infty} \frac{2 \cdot 3^{2n+1} - 4 \cdot 5^{n+2}}{10^n} \]

5. \[ \sum_{n=1}^{\infty} \left( \frac{3}{5^n} + \frac{1}{n} \right) \]

6. \[ \sum_{n=1}^{\infty} \frac{n^3 + 3n + 4}{n^2 - 1} \]
7. The partial sums of this series are telescoping. Determine whether the series is convergent or divergent, and find the sum if it is convergent.

\[ \sum_{n=1}^{\infty} \left( \frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n+1}} \right) \]

8. The partial sums of this series are telescoping. Determine whether the series is convergent or divergent, and find the sum if it is convergent.

\[ \sum_{n=1}^{\infty} \ln \left( \frac{n}{n+1} \right) \]
9. Express $0.\overline{8} = 0.888888\ldots$ as a fraction.

10. Express $10.\overline{135} = 10.13535353535\ldots$ as a fraction.