Section 8.5 Problems

1. Suppose that $\sum c_n x^n$ converges when $x = -4$ and diverges when $x = 6$. What can be said about the convergence or divergence of the following series?

   (A) $\sum c_n$

   (B) $\sum (-3)^n c_n$

   (C) $\sum 8^n c_n$

   (D) $\sum (-9)^n c_n$

2. For the following power series, find the radius and interval of convergence.

   (A) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n x^n}{\sqrt{n^2+3}}$

   (B) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}(x+2)^n}{n2^n}$

   (C) $\displaystyle\sum_{n=1}^{\infty} \frac{n! x^n}{1 \cdot 3 \cdot 5 \cdot \ldots \cdot (2n-1)}$

   (D) $\displaystyle\sum_{n=1}^{\infty} \frac{x^n}{n^4+2}$

   (E) $\displaystyle\sum_{n=0}^{\infty} \frac{(2x+3)^n}{n!}$

3. Show that the power series $(A) - (C)$ have the same radius of convergence. Then show that (A) diverges at both endpoints, (B) converges at only one endpoint, and (C) converges at both endpoints.

   $(A) \displaystyle\sum_{n=1}^{\infty} \frac{x^n}{5^n}$ $\qquad$ $(B) \displaystyle\sum_{n=1}^{\infty} \frac{x^n}{n5^n}$ $\qquad$ $(C) \displaystyle\sum_{n=1}^{\infty} \frac{x^n}{n^2 5^n}$