

If $a_n = n!(8x - 1)^n$, then $\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right| = \lim_{n \rightarrow \infty} \left| \frac{(n+1)!(8x-1)^{n+1}}{n!(8x-1)^n} \right|$
 $= \lim_{n \rightarrow \infty} (n+1) |8x-1| \rightarrow \infty$ as $n \rightarrow \infty$ for all $x \neq \frac{1}{8}$.
Since the series diverges for all $x \neq \frac{1}{8}$, $R = 0$ and $I = \{\frac{1}{8}\}$.