9. [8 points] Determine whether the following series converges or diverges. If it converges, determine if it is absolute or conditional convergence **Circle your final answer choice**. Fully justify your answer including using proper notation and showing mechanics of any tests you use.

$$\sum_{n=1}^{\infty} \frac{n(-2)^n}{3^n}$$

Circle one: **Absolutely Converges**   **Conditionally Converges**   **Diverges**