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Multiple Choice.

$$\sum_{n=0}^{\infty} \frac{(-1)^n}{3^n} =$$

(A) $-\frac{1}{4}$

(B) $-\frac{3}{4}$

(C) $\frac{1}{4}$

(D) $\frac{3}{4}$

Does the series $\sum_{n=1}^{\infty} \frac{2n}{3n-1}$ converge or diverge?

Give a reason for your answer.

$$\lim_{n \rightarrow \infty} \frac{2n}{3n-1} = \lim_{n \rightarrow \infty} \frac{x(2)}{x(3-\frac{1}{n})} = \frac{2}{3} \neq 0$$

Therefore, by the divergence test

$$\sum_{n=1}^{\infty} \frac{2n}{3n-1} \text{ diverges}$$