10.3 The *n*th Term Test for Divergence

Calculus

Practice

For each of the following series, determine the convergence or divergence of the given series. State the reasoning behind your answer.

1.
$$\sum_{n=1}^{\infty} \frac{3-2n}{5n+1}$$

$$\lim_{n\to\infty} \frac{3-2n}{5n+1} = -\frac{2}{5n}$$

Diverges by the nth
Term Test.
3.
$$\sum_{n=1}^{\infty} \frac{2n}{7n^{2}+1}$$

$$\lim_{n\to\infty} \alpha_{n} = 2$$

Diverges by the
nth- Term Test.
5.
$$\sum_{n=1}^{\infty} \frac{7^{n}+1}{7^{n}+1} = \frac{7}{7^{n}+1} + \frac{1}{7^{n},7^{1}}$$

$$\lim_{n\to\infty} \alpha_{n} = \frac{2}{5n}$$

$$\lim_{n\to\infty} \alpha_{n} = 2$$

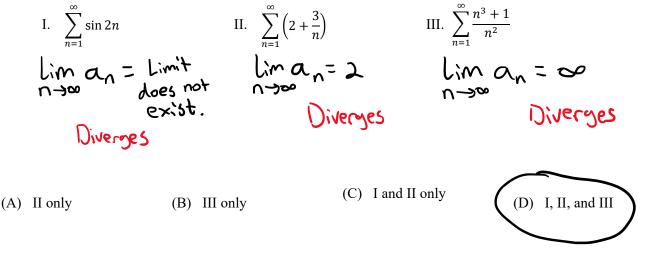
$$\lim_{n\to\infty} \alpha_{n} = 0$$

$$\lim_{n\to\infty} \alpha_{n} = \infty$$

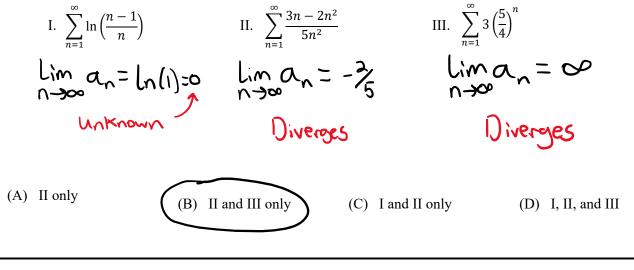
$$\lim_{n\to\infty$$

10.3 The *n*th Term Test for Divergence

- **Test Prep**
- 7. The *n*th-Term Test can be used to determine divergence for which of the following series?



8. The *n*th-Term Test can be used to determine divergence for which of the following series?



9. If
$$a_n = \cos\left(\frac{\pi}{2n}\right)$$
 for $n = 1, 2, 3, ...,$ which of the following about $\sum_{n=1}^{\infty} a_n$ must be true?
 $\lim_{n \to \infty} a_n = \cos(n) = 1 \longrightarrow \text{must diverge}$

(A) The series converges and $\lim_{n \to \infty} a_n = 0$.

(C) The series diverges and $\lim_{n \to \infty} a_n \neq 0$

(B) The series diverges and $\lim_{n \to \infty} a_n = 0$

