1. The Divergence Test:

Given a series $\sum_{n=1}^{\infty} a_n$,

if $\lim_{n\to\infty} a_n = c \neq 0$ OR $\lim_{n\to\infty} a_n = DNE$, then $\sum_{n=1}^{\infty} a_n$ diverges.

2. For each series below, find the limit if the *terms* of the series and determine **if** the Divergence Test applies. If the test applies, draw a conclusion.

(a) $\sum_{n=1}^{\infty} \frac{n}{40n+30}$

$\lim_{n\to\infty} \frac{n}{40n+30} = \frac{1}{40} \neq 0$. Series Diverges

(b) $\sum_{n=1}^{\infty} \frac{n}{40n^2+30}$

$\lim_{n\to\infty} \frac{n}{40n^2+30} = 0$

Divergence Test does not apply. We can draw no conclusion.

(c) $\sum_{n=1}^{\infty} 8^{(n^{-2})}$

$\lim_{n\to\infty} 8^{1/n^2} = 1 \neq 0$

Series diverges.

3. Explain how you know the following argument is FALSE:

The series $\sum_{n=1}^{\infty} a_n$ converges because $a_n \to 0$ as $n \to \infty$.

Ex| harmonic series: $\sum \frac{1}{n}$ diverges even though $\lim \frac{1}{n} = 0$.