9. The limit of the sequence $\{a_n\} = \left\{\dfrac{n \ln n}{n^2+5}\right\}$ is

a) 0 b) $\dfrac{2}{5}$ c) $\dfrac{1}{2}$ d) 1 e) $\ln 2$ f) $\{a_n\}$ is divergent

10. Determine the convergence behavior of the following two alternating series:

(I) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n \ln n}$ (II) $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n 3^n}{4^{n+1}}$

a) (I) converges absolutely, (II) converges conditionally
b) (I), (II) converge absolutely
c) (I) converges conditionally, (II) converges absolutely
d) (I), (II) converge conditionally
e) (I) diverges, (II) converges conditionally
f) (I) diverges, (II) converges absolutely

11. The series $\sum_{n=1}^{\infty} \frac{n+\sqrt{n}}{n^2+7}$

a) converges by comparison to $\sum_{n=1}^{\infty} \frac{1}{n}$ b) diverges by comparison to $\sum_{n=1}^{\infty} \frac{1}{n}$

c) converges by comparison to $\sum_{n=1}^{\infty} \frac{1}{n^2}$ d) diverges by comparison to $\sum_{n=1}^{\infty} \frac{1}{n^2}$

e) converges by the n^{th} root test f) diverges by the n^{th} root test

18. Find the precise interval of convergence of the series

$$\sum_{n=1}^{\infty} \frac{(3x-2)^n}{n3^n}.$$

(A) $(-1, 1]$ (B) $[-1, 1)$ (C) $\left(-\frac{1}{3}, \frac{5}{3}\right]$

(D) $\left[-\frac{1}{3}, \frac{5}{3}\right)$ (E) $\left[0, \frac{4}{3}\right]$ (F) $\left(0, \frac{4}{3}\right]$