

Math 2300-013: Quiz 7b

Name: _____

Score: _____

Collaborators: _____

Directions: This take-home quiz will be due at the beginning of class on Monday, October 23. You may use your notes, textbook, and colleagues from our class as resources, but your final write-up should be in your own words. If you work with collaborators from our class, please include their names on this quiz.

1. (5 points) Determine if the series converges or diverges. Indicate which test you used.

Series	Converges/Diverges	Test Used/Notes
a) $\sum_{k=5}^{\infty} \frac{\pi^k}{e^{k+1}}$	Converges Diverges	
b) $\sum_{k=1}^{\infty} (\sqrt{k+1} - \sqrt{k})$	Converges Diverges	
c) $\sum_{n=1}^{\infty} \cos(3n)$	Converges Diverges	
d) $\sum_{k=3}^{\infty} \frac{1}{k \ln k^2}$	Converges Diverges	
e) $\sum_{k=1}^{\infty} \sqrt[3]{k^{-4}}$	Converges Diverges	
f) $\sum_{n=1}^{\infty} \frac{n^3 + 5n - 3}{n^5 + 7n^4 - 2}$	Converges Diverges	
g) $\sum_{n=2}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n^2 - 3n + 1}}$	Converges Diverges	
h) $\sum_{k=1}^{\infty} \frac{(k!)^3}{(3k)!}$	Converges Diverges	
i) $\sum_{n=1}^{\infty} \frac{2 - \sin(n)}{n}$	Converges Diverges	
j) $\sum_{n=1}^{\infty} \frac{1}{n^{\ln n}}$	Converges Diverges	

2. (3 points) Do the following series converge or diverge? For these problems, show all of your work and include the hypotheses required for the tests you used.

(a)
$$\sum_{k=1}^{\infty} \frac{k^{100}}{(k+1)!}$$

(b)
$$\sum_{k=1}^{\infty} \frac{1}{5^k + 8k + 23}$$

(c)
$$\sum_{k=1}^{\infty} \frac{n}{3^n}$$