

Name:

Math 116 Exam 2

March 23, 2011

Directions: WRITE YOUR NAME ON THIS EXAM! Except where indicated, merely finding the answer to a problem is not enough to receive full credit; you must show how you arrived at that answer. Unless indicated, DO NOT convert irrational numbers such as $\sqrt{3}$ or π into decimal approximations; just leave them as they are.

1) Find the sum of the series or show that it diverges.

a)
$$\sum_{n=2}^{\infty} \frac{(-10)^{n+1}}{2^{4n}}$$

b)
$$\sum_{n=1}^{\infty} \left(\frac{1}{\sqrt{n+2}} - \frac{1}{\sqrt{n+3}} \right) \text{ (Hint: partial sums.)}$$

2) Determine whether the following series converge or diverge. CLEARLY STATE WHICH TEST YOU ARE USING!

a) $\sum_{n=5}^{\infty} \frac{\ln(n^{2n})}{(n+3)!}$

b) $\sum_{n=7}^{\infty} e^{\frac{1-n}{n}}$

c) $\sum_{n=1}^{\infty} \frac{5n^2}{\sqrt{n^3+1}}$

3) Evaluate the integral $\int_0^{10} \frac{dx}{x^2 - 3x - 28}$.

4) Find the limit of the sequence or show that it diverges.

a) $\left\{ \left(1 - \frac{2}{n}\right)^{3n} \right\}_{n=1}^{\infty}$

b) $\left\{ \frac{3n^2 - \arctan(n!)}{n^2} \right\}_{n=4}^{\infty}$