MATH 1920 Calculus II Practice for Test 4
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SHOW ALL WORK required to sufficiently use the convergence test in each of the following problems. Then use the test to determine whether the series converges or diverges. An answer of converges or diverges without correct supporting work and logic is worth nothing. You MAY use any one page (one-sided) of notes for assistance with this test.

1. Determine whether the following sequences converge. If the sequence converges, find its limit.

a. $A_n = n\left(\sqrt{n^2+3} - n\right)$ b. $B_n = e^{4-n^2}$

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

3. Use the Geometric Series Test to determine if $\sum_{n=0}^{\infty} \frac{3}{4^n}$ converges. If it does, find its sum.

4. Use the Geometric Series Test to determine if $\sum_{n=0}^{\infty} \frac{7+6^n}{7^n}$ converges. If it does, find its sum.

5. Use the Test for Divergence to determine if $\sum_{k=1}^{\infty} \frac{k(k+2)}{(k+3)^3}$ diverges.

6. Use the p-series and comparison tests to determine convergence of $\sum_{n=1}^{\infty} \frac{1}{\sqrt[3]{n^2-5}}$.

7. Use the Leibniz Test to determine convergence of $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}$.

8. Use the Limit Comparison Test to determine convergence of $\sum_{n=1}^{\infty} \frac{3n+7}{n^3+5n+1}$.

9. Use the Limit Comparison Test to determine convergence of $\sum_{n=4}^{\infty} \frac{15}{2^n-9}$.

10. Use the Ratio Test to determine convergence of $\sum_{n=1}^{\infty} \frac{n^{400}}{n!}$.

11. Find the Interval of Convergence of $\sum_{n=1}^{\infty} \frac{(-1)^n (x-5)^n}{4^n n}$.

12. Find the Interval of Convergence of $\sum_{n=1}^{\infty} \frac{5^n (x+4)^n}{4n}$.

13. Find the arc length of $y = x^{\frac{3}{2}}$ from $x = 1$ to $x = 3$.

14. Find the surface area resulting from rotating $y = 2x^3$ about the x-axis from $x = 0$ to $x = 2$.