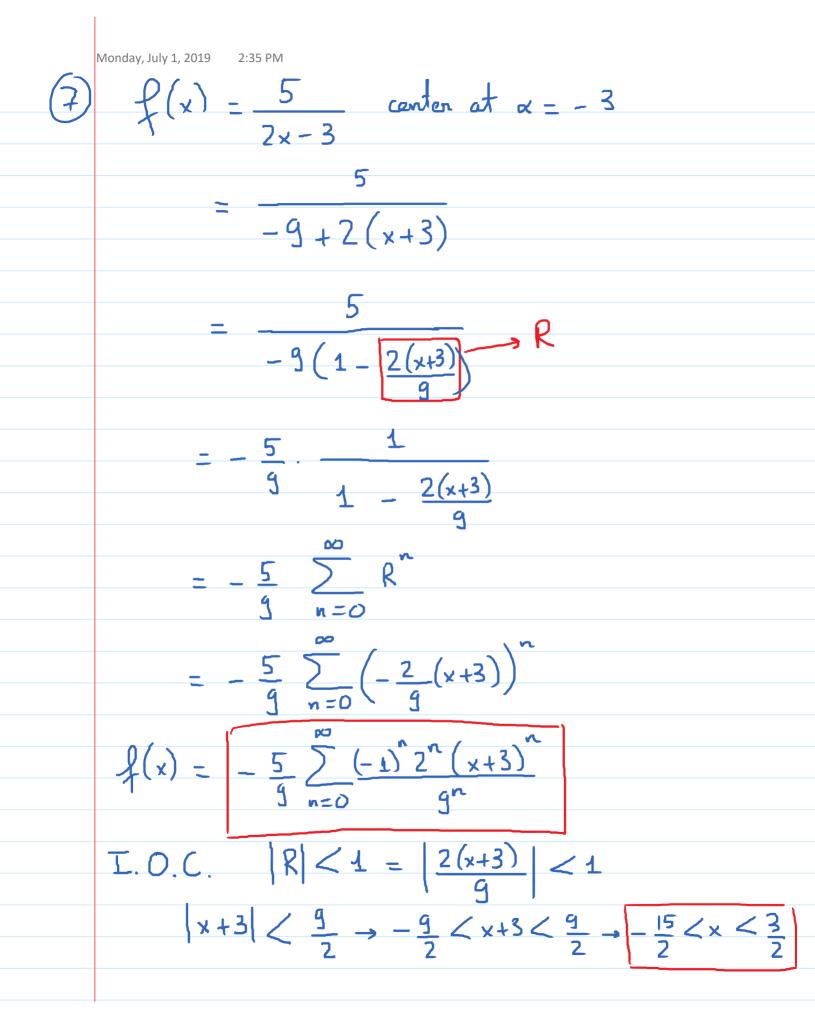
Review 3 2:08 PM $\sum_{n=2}^{n} \frac{1}{n \sqrt{l_n(n)}} \qquad f(x) = \frac{1}{x \sqrt{l_n(x)}}$ (1)* f(x) ≥0 on [2,00) * (ontinuous on [2,00) (ble it doesn't include (- 00, 1]) * Decreasing, x. (ln(x) is an increasing function no <u>1</u> is a decreasing function on [2,00) $\int \frac{1}{x \sqrt{\ln(x)}} dx = \lim_{b \to \infty} \int \frac{1}{x \sqrt{\ln(x)}} dx$ $u = ln(x); du = \frac{1}{x} dx$ $\int \frac{du}{\sqrt{u}} = \left(u^{-\frac{1}{2}} du = 2 u^{-\frac{1}{2}} = 2 \left(l_n(x) \right)^{\frac{4}{2}} \right)$ $\lim_{b \to \infty} 2(\ln(x))^{\frac{1}{2}} \Big|_{2}^{b} = \lim_{b \to \infty} (2(\ln(b))^{\frac{1}{2}} - 2(\ln(2))^{\frac{1}{2}})$ ~ 00 Series diverger.

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(2)
$$\frac{2n}{2n} = \frac{2n^2 - 4}{3n^5 + 2n + 1}$$
 limit Companing thin to $\sum_{n=1}^{\infty} \frac{1}{n^3}$
 $\lim_{n \to \infty} \frac{a_n}{b_n} = \lim_{n \to \infty} \frac{2n^2 - 4}{3n^5 + 2n + 1} + \frac{n^3}{1}$
 $= \lim_{n \to \infty} \frac{2n^5 - n^3}{3n^5 + 2n + 1} = \frac{2}{3} > 0$
Series behaves like $\sum_{n=1}^{\infty} \frac{4}{n^3}$
Since $\sum_{n=1}^{\infty} \frac{4}{n^3}$ convergen (p-series, p=3), the
original series convergen.
(3) Want: first reglacted term ≤ 0.001
 $= \frac{4}{2(N+1)^3 - 1} \leq 0.001 = \frac{4}{1000}$
 $\rightarrow 2(N+1)^3 - 1 \geq 1000$
 $\rightarrow 2(N+1)^3 \geq 1001$
 $= (N+1)^3 \geq 1001$

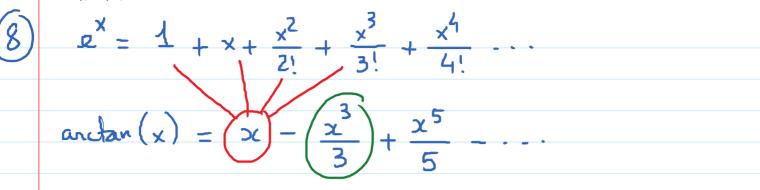
Monday, July 1, 2019 2:22 PM $N \ge \frac{1}{2} \frac{1001}{2} - 1 = 6.9...$ We need at least 7 terms to achieve the required accuracy. $\frac{l_{inn}}{n \rightarrow \infty} \frac{a_{n+1}}{a_n} = \frac{l_{inn}}{n \rightarrow \infty} \frac{2 + cos(n)}{\sqrt{n}}$ 4 $0 \leq \frac{2 + \cos(n)}{\sqrt{n}} \leq \frac{3}{\sqrt{n}}$ Anna By Squeeze Theorem, lim 2+cos(n) = < 1So, By the Ratio Test, the resier converges.

Monday, July 1, 2019 2:26 PM f(x) = ln(x) $f'(x) = \frac{1}{x}$; $f''(x) = -\frac{1}{x^2}$; $f'''(x) = \frac{2}{x^3}$; $f'' = -\frac{6}{x^4}$ $f(2) = \ln(2); f'(2) = \frac{1}{2}; f''(2) = -\frac{4}{4}; f'''(2) = \frac{4}{4}$ $\int_{1}^{(4)}(2) = -\frac{3}{2}$ $T_{L}(x) = f(2) + f'(2)(x-2) + \frac{f''(2)}{2}(x-2)^{2}$ $+ \frac{f^{(1)}(2)}{3!}(x-2)^{3} + \frac{f^{(4)}(2)}{4!}(x-2)^{4}$ $ln(2) + \frac{1}{2}(x-2) - \frac{1}{(2!)(4)}(x-2)^2 + \frac{1}{(3!)4}(x-2)^5$ $|_{\mathcal{L}}(\mathbf{x}) =$ $-\frac{3}{(41)(8)}(x-2)^{4}$ $f(7.1) \approx T_{1}(7.1) = 0.7$

Monday, July 1, 2019 2:30 PM $a_{n} = \frac{n^{2} x^{n}}{2 \cdot 4 \cdot 6 \cdots (2n)} = \frac{n^{c} x^{2}}{2(1 \cdot 2 \cdot 3 \cdots n)}$ (6) $\frac{n^2 \times^n}{2(n!)}$ $a_n =$ $a_{n+1} = \frac{(n+1)^2 x^{n+1}}{2[(n+1)!]}$ $\frac{a_{n+1}}{a_n} = \frac{(n+1)^2 x^{n+1}}{2(n+1)!} \cdot \frac{2(n!)}{n^2 x^n}$ $= \frac{(n+1)^{2}}{(n+1)^{n^{2}}} |x| = \frac{n+1}{n^{2}} |x|$ $\lim_{n \to \infty} \frac{a_{n+1}}{a_n} = \lim_{n \to \infty} \frac{n+1}{n^2} |x| = 0 < 1$ Since limit < 1 regardless of values of x, the series converges for all x. Radius of convergence = as I.O.C. = (-00, 00)



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$$\begin{array}{c} x + x^{2} + \frac{x^{3}}{2!} + \frac{x^{4}}{3!} \\ + \\ - \frac{x^{3}}{3} - \frac{x^{4}}{3} \\ - \frac{x^{4}}{3} \end{array}$$

$$e^{x} \arctan(x) = x + x^{2} + \frac{x^{3}}{6} - \frac{x^{4}}{6}$$

