MATH 1432, SECTION 12869 SPRING 2014

HOMEWORK ASSIGNMENT 10 DUE DATE: 4/2/14 IN LAB

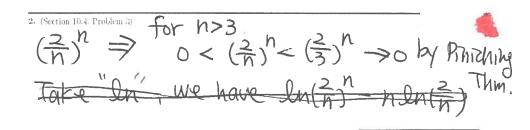
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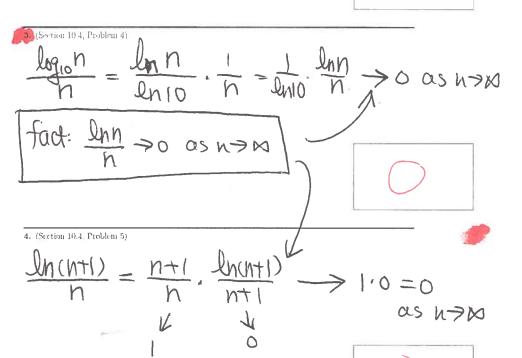
INSTRUCTIONS

- Print out this file and complete the problems. You must do all the problems!
- If the problem is from the text, the section number and problem number are in parantheses.
- . Use a blue or black pen or a pencil (dark).
- · Write your solutions in the spaces provided. You must show work in order receive credit for a problem
- · Remember that your homework must be complete, neatly written and stapled.
- . Submit the completed assignment to your Teaching Assistant in lab on the due date.
- If you do not do all of the problems, then your recitation quiz from the previous Friday will automatically become a ZERO.

1. Section 10 4. Problem 2)

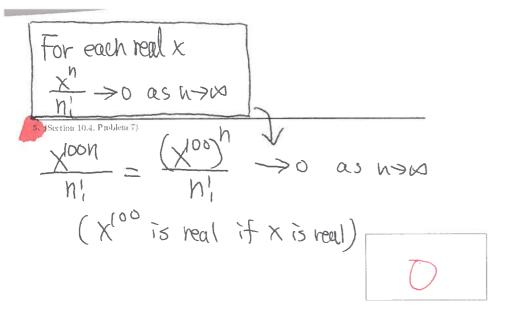
 $e^{-\alpha}$ Fix α and $n > \infty$ $-\alpha > 0$ Since e^{x} is writi. and $-\alpha > 0$ e^{x} e^{x} e^{x} e^{x} e^{x} e^{x} e^{x} e^{x} e^{x}





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$$\frac{3^{n+1}}{4^{n-1}} = \frac{3^2 \cdot 3^{n-1}}{4^{n-1}} = 3^2 \cdot (\frac{3}{4})^{n-1} \rightarrow 9.0 = 0$$

$$(\sin \alpha \frac{3}{4} < 1)$$

$$(\sin \alpha \frac{3}{4} < 1)$$

$$\int_{-h}^{0} \frac{\partial^{2} x}{\partial x} = \frac{e^{3x}}{2} \Big|_{-h}^{0} = \frac{1}{2} \left(1 - \frac{e^{2h}}{2}\right)$$

$$= \frac{1}{2} - \frac{e^{2h}}{2}$$

$$= \frac{1}{2} - \frac$$

$$\int_0^n e^x dx = -e^x \Big|_0^n = |-e^n| \rightarrow |-o=|$$

$$e^n = |-e^n| \rightarrow |-o=|$$

1. 15 ion 104, Problem 17)

$$\int_{n}^{h} \frac{dx}{1+x^{2}} = 2 \int_{0}^{h} \frac{dx}{1+x^{2}} = 2 \arctan x \Big|_{0}^{n}$$

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10. (Section 10.4, Problem 20)

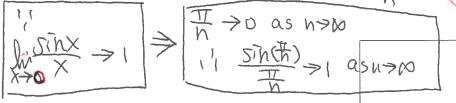




$$\frac{\ln n^2}{n} = 2\frac{\ln n}{n} \rightarrow 2.0 = 0 \text{ as } n \rightarrow \infty$$



$$n^2 \sin \frac{\pi}{N} = n^2 \frac{\pi}{N} \cdot \frac{\sin(\frac{\pi}{N})}{(\frac{\pi}{N})} = n\pi \cdot \frac{\sin(\frac{\pi}{N})}{\frac{\pi}{N}} \Rightarrow \text{diverge.}$$



3. Section 10.4. Problem 24)

$$\frac{n!}{2n} = \frac{n(n+1)!}{2n} = \frac{(n+1)!}{2} \Rightarrow \text{diverge}.$$



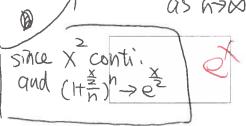
$$\frac{h^n}{2n^2} = \frac{n^n}{(2h)^n} = \left(\frac{N}{2n}\right)^n \rightarrow 0 \quad \text{as } n \rightarrow \infty$$

When
$$n > 2$$
.

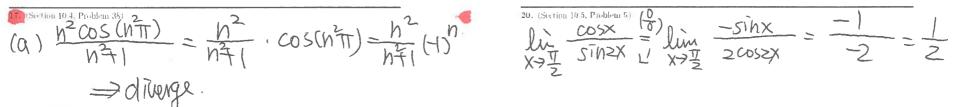
 $0 < \left(\frac{h}{2n}\right)^n < \left(\frac{1}{2}\right)^n$



10. Section 10.4, Problem 351



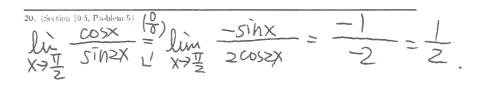
$$a_{n}=\cos(n^{2}T)=(-1)^{n}$$

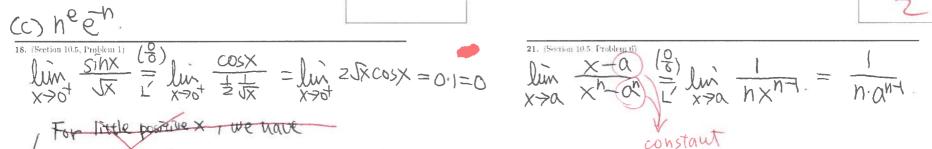


(p) $h(S_{\mu}-1)$





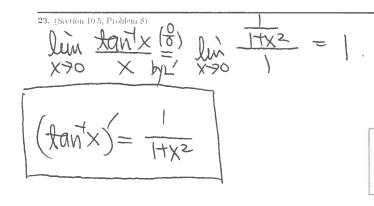




9. (Section 10.5, Problem 3) $\frac{(0)}{(0)}$ $\frac{(0)}{(0)}$

$$\lim_{X \to 0} \frac{2^{X} - 1}{X} \frac{\binom{9}{9} \binom{10}{10}}{X} = \ln 2$$

$$(z^{x-1}) = (e^{\ln z^{x}} - 1)$$
 $= (e^{x \ln z} - 1) = \ln z \cdot e^{-\ln z} \cdot e^{-\ln z}$
 $= (e^{x \ln z} - 1) = \ln z \cdot e^{-\ln z} \cdot e^{-\ln z}$



$$\lim_{X \to 0} \frac{e^{X} + e^{X}}{X(1+X)} = \frac{1}{1+2X} = \frac{1}{$$



26. (Section 10.5, Problem 18)
$$\lim_{X \to 0} \frac{\cos X + \frac{1}{2}}{X^4} = \lim_{X \to 0} \frac{\sin X + x}{4x^3}$$

$$\lim_{X \to 0} \frac{\cos X + \frac{1}{2}}{X^4} = \lim_{X \to 0} \frac{\sin X}{4x^3}$$

$$\lim_{X \to 0} \frac{\cos X + \frac{1}{2}}{12X^2} = \lim_{X \to 0} \frac{\sin X}{24X}$$

$$\lim_{X \to 0} \frac{\cos X}{12X^2} = \lim_{X \to 0} \frac{\sin X}{24X}$$

$$\lim_{X \to 0} \frac{\cos X}{12X^2} = \lim_{X \to 0} \frac{\cos X}{24X}$$

$$\lim_{X \to 0} \frac{\cos X}{12X^2} = \lim_{X \to 0} \frac{\cos X}{24X}$$

$$\lim_{X \to 0} \frac{1 + x - e^{X}}{X(e^{X} - 1)} \lim_{Y \to 0} \frac{1 - e^{X}}{e^{X} + xe^{X}} \lim_{X \to 0} \frac{1 - e^{X}}{e^{X} + xe^{X}} \lim_{X \to 0} \frac{1 - e^{X}}{e^{X} + xe^{X}} = -\frac{1}{2}$$

28. (Section 10.5, Pichlem 21)
$$\lim_{X \to \infty} \frac{X - \tan x}{X - \sin x} \frac{\binom{0}{6}}{\sqrt{2}} \lim_{X \to \infty} \frac{1 - \sec x}{1 - \cos x}$$

$$\lim_{X \to \infty} \frac{(\frac{0}{6})}{\sqrt{2}} \lim_{X \to \infty} \frac{1 - \sec x}{\sqrt{2}} \lim_{X \to \infty} \frac{1 - \sec x}{\sqrt{2}}$$

$$\lim_{X \to \infty} \frac{(\frac{0}{6})}{\sqrt{2}} \lim_{X \to \infty} \frac{-2 \sec x}{\sqrt{2}} \cdot \frac{\sec x}{\cos x}$$

$$\lim_{X \to \infty} \frac{(\frac{0}{6})}{\sqrt{2}} \lim_{X \to \infty} \frac{-2 \sec x}{\sqrt{2}} \cdot \frac{\cos x}{\cos x}$$

$$\lim_{X \to \infty} \frac{(\frac{0}{6})}{\sqrt{2}} \lim_{X \to \infty} \frac{-2 \sec x}{\sqrt{2}} \cdot \frac{\cos x}{\cos x}$$

$$\lim_{X \to \infty} \frac{(\frac{0}{6})}{\sqrt{2}} \lim_{X \to \infty} \frac{(-\frac{0}{6})}{\sqrt{2}} \lim_{X \to$$

$$\lim_{X \to 0} \frac{x e^{nX} - x}{1 - \cos nx} = \lim_{h \to 0} \frac{\ln x}{1 + \sin nx}$$

$$\lim_{X \to 0} \frac{x e^{nX} - x}{1 - \cos nx} = \lim_{h \to 0} \frac{\ln x}{1 + \sin nx}$$

$$\lim_{X \to 0} \frac{\ln x}{1 + \cos nx} = \lim_{X \to 0} \frac{\ln x}{1 + \sin nx}$$

$$\lim_{X \to 0} \frac{\ln x}{1 + \cos nx} = \lim_{X \to 0} \frac{\ln x}{1 + \sin nx}$$

$$\frac{\left(\frac{6}{6}\right)}{\frac{1}{1}} \frac{ne + ne + nxe^{nx}}{ne + ne + nxe^{nx}} = \frac{2n}{1} = \frac{2}{n}$$

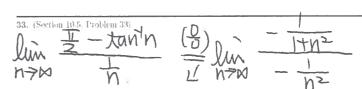
$$\lim_{X \to 0} \frac{2X - \sin TX}{4X^2 - 1} = \frac{0 - 0}{1} = 0$$



$$\lim_{X \to 0} \frac{\cos x - \cos 3x}{\sin (x^2)} = \lim_{X \to 0} \frac{-\sin x + 3\sin 3x}{2x\cos(x^2)}$$

$$\frac{(9)}{2} \lim_{x \to 0} \frac{-\cos x + 9\cos 3x}{2\cos x^2 - 4x^2 \sin x^2} = \frac{8}{2}$$

$$\lim_{x \to 0} \frac{\frac{1}{\tan x}}{\frac{1}{\tan x}} = \frac{1}{2}$$



$$=\frac{1}{N^2}$$

Find alb sit, lim cosax = -4. First, plug'o' in we get 1-b, but we know this limit exists. so 1-b = 0" => b=1. If b=1, we have (&) form. Then, by L'HōpITAL'S ROLE, we have lun cosax-1 (3) lun -asinax $\frac{1}{2} \ln \frac{-a \cos ax}{4} = \frac{-a^2}{4} = -4$ Columbte $\lim_{x \to 0} \frac{(1+x)^{x}-e}{x} = \frac{(\frac{0}{0})}{(\frac{1}{0})} \lim_{x \to 0} \frac{(1+x)^{x}-e}{x} = \lim_{x \to 0} \frac{(\frac{0}{0})}{(\frac{1}{0})} \lim_{x \to 0} \frac{(\frac{0}{0})}{(\frac{0}{0})} \lim_{x \to 0} \frac{(\frac{0}{0})}{(\frac{1}{0})} \lim_{x \to 0} \frac{(\frac{0}{0})}{(\frac{0}{0})} \lim_{x \to 0} \frac{($ Since we know lim (17x) = e Check Im (-(ITX) In(ITX) tX and try to find the derivative of CHXX - 2 = 6.(-5)=-6 $\left[\left(H \times \frac{1}{2}\right] = \left[P \ln \left(H \times \frac{1}{2}\right)^{2}\right] = \left[P \ln \left(H \times \frac{1}{2}\right)^{2}\right]$ = (\frac{1}{x}ln(HX)). exln(HX) So this limit exists and equals"-1" $= \left(-\frac{1}{X^2} \ln(1+X) + \frac{1}{X} \cdot \frac{1}{1+X}\right) \left(1+X\right)^{\frac{1}{X}}$ STACE both limits, lun (HX) and lung $= \left(\frac{-(1+x)\ln(1+x)+x}{x^2+x^3}\right)^{1/2}(1+x)^{\frac{1}{2}}$ exist, so we can say his ab = hia his b