Info...

3hrs **Final Exam Review Problems Are Posted**

Take time to submit your teacher evaluation on *CourseWare*.

21 Note: Homework 13 is not due until the 29th!! Please consider taking the time to complete this survey.	22 EMCF38 due at 9am Blank Slides: page, 4-per, video notes, video	23 Complete the Online Teacher Evaluation by May 3 to Receive 5 Bonus Points	24 EMCF39 due at 9am Notes: page, 4-per	25 Final Exam Review Video (3 hours) Notes	26 EMCF40 due at 9am Notes: page, 4-per (in-class partial review for test 4) The 3 hour Video Review posted on the 20th works through all of these problems, and more. Quiz in lab/workshop	27 Quiz 13 closes (11.5-11.6) Test 4 starts
28	29 EMCF41 due at 9am – All answers are C. Blank Slides: page, 4-per Homework 13 due in lab/workshop Last day of class	30 Practice Test 4 Closes	May 1 Final Exam Review Video (3 hours) Notes	2 Complete the Online Teacher Evaluation by May 3 to Receive 5 Bonus Points	3 There are 20 questions on the final exam. More than half of them will be written. Good Luck!!!	4 Quiz 14 closes (11.7-11.8)
5	6 Final Exam Starts	7	8 Practice Final Exam Closes	9	10	11

Consider giving something back!

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Give the interval of convergence and radius of convergence for the power series $\sum_{n=1}^{\infty} \frac{(x+1)^n}{2^n(n+1)}$.

Centered at -1.

To get the radius of convergence, check ABS conv.:

$$\sum_{n=1}^{\infty} \left| \frac{(x+1)^n}{2^n(n+1)} \right|$$

$$= \sum_{n=1}^{\infty} \frac{|x+1|^n}{2^n(n+1)}$$

$$= \sum_{n=1}^{\infty} \left(\frac{|x+1|}{2}\right)^n \cdot \frac{1}{(n+1)}$$

$$\boxed{\begin{aligned} &\text{Thought: Probably} \\ &\frac{|x+1|}{2} < 1 \\ &|x+1| < 2 \end{aligned}}$$

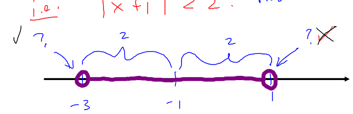
root: $\lim_{n\to\infty} \left(\frac{|x+1|^n}{2^n(n+1)}\right)^{1/n}$

$$= \lim_{n\to\infty} \frac{|x+1|}{2} \cdot \frac{1}{(n+1)^{1/n}} = \frac{|x+1|}{2}$$

$\frac{1}{(n+1)^{1/n}} \to 1$

$\therefore$ the root test implies we have abs. conv. for $\frac{|x+1|}{2} < 1$

i.e. $|x+1| < 2$. Radius of conv is 2.



$x=-3$: Subst $x=-3$ into the original series

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

conv. alt. series.
(Do it)

$x=1$: Subst $x=1$ into the original series.

$$\sum_{n=1}^{\infty} \frac{(1+1)^n}{2^n(n+1)} = \sum_{n=1}^{\infty} \frac{1}{n+1}$$

Diverges by LCT with $\sum \frac{1}{n}$.

$\therefore$ The radius of conv. is 2 and the interval of conv. is

$[-3, 1)$.

Let $f(x)=\sum_{n=1}^{\infty} \frac{(x+1)^n}{2^n(n+1)}$. Give the value for $f^{(6)}(-1)$.

T.S. for $f(x)$ centered at -1.

$$f(-1) + f'(-1)(x+1) + \frac{f''(-1)}{2}(x+1)^2 + \frac{f'''(-1)}{6}(x+1)^3$$
$$+ \cdots + \boxed{\frac{f^{(6)}(-1)}{6!}}(x+1)^6 + \cdots$$

From above, $\frac{1}{2^6(6+1)} = \frac{f^{(6)}(-1)}{6!}$

$$\Rightarrow f^{(6)}(-1) = \frac{6!}{2^6 \cdot 7}$$

Popper 33

Give the radius of convergence for each power series. If your answer is ∞, then input 999.

This is a popper grade, and in addition, the score will replace your lowest popper grade.

1. $\sum_{n=1}^{\infty} \frac{(-1)^{n+1} x^n}{n}$ 1
2. $\sum_{n=1}^{\infty} 3^{n+1} x^n$ 1/3
3. $\sum_{n=1}^{\infty} \frac{2^n}{n^2+1} x^n$ 1/2
4. $\sum_{n=1}^{\infty} \frac{(-1)^n}{n^2+1} x^n$ 1
5. $\sum_{n=1}^{\infty} \frac{(-2)^n}{n^2+1} x^n$ $\frac{1}{2}$
6. $\sum_{n=0}^{\infty} \frac{x^n}{2n+1}$ 1
7. $\sum_{n=0}^{\infty} \frac{x^n}{2^n+1}$ 2
8. $\sum_{n=0}^{\infty} \frac{x^n}{n!} = e^x$ ∞
9. $\cos(x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}$ ∞
10. $\sin(x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$ ∞