I.O.C $-\infty < x < \infty$	Construct the first 3 nonzero terms and the general term of the Maclaurin Series generated by the function and give the interval of convergence. A) $f(x) = e^{5x}$ $= 1 + 5x + \frac{(5x)^2}{2}$ general term $= \frac{(5x)^n}{n!}$ $e^x = 1 + x + \frac{x^2}{2}$ general term $= \frac{x^n}{n!}$
$\boxed{\begin{array}{l}\text{I.O.C}\\ -1 < 2x \le 1\\ -\frac{1}{2} < x \le \frac{1}{2}\end{array}}$ I.O.C $-1 < x \le 1$	B) $f(x) = \ln(1+2x)$ $= (2x) - \frac{(2x)^2}{2} + \frac{(2x)^3}{3}$ general $= \frac{(-1)^{n-1}(2x)^n}{n}$ $\ln(1+x) = x - \frac{x^2}{2} + \frac{x^3}{3}$ general $= (-1)^{n-1}\frac{x^n}{n}$
geometric $\frac{a}{1-r}$	$\boxed{f(x) = \frac{1}{1+(x+4)}} \rightarrow 1 - (x+4) + (x+4)^2 - \cdots + (x+4)^n$ $\boxed{\text{C) } f(x) = \frac{1}{x+5}}$ $= \frac{1}{5+x} = \frac{\frac{1}{5}}{\frac{5}{5}+\frac{x}{5}} = \frac{\frac{1}{5}}{1+\frac{x}{5}}$ First term $= \frac{1}{5}$ common ratio $= -\frac{x}{5}$ 3 terms $= \frac{1}{5} - \frac{x}{25} + \frac{x^2}{125}$ general term $= (-1)^n\left(\frac{1}{5}\right)\left(\frac{x}{5}\right)^n = \frac{1}{5}\left(\frac{-x}{5}\right)^n$

$1 + \frac{4}{5} + \left(\frac{4}{5}\right)^2 + \left(\frac{4}{5}\right)^3 + \cdots$

$1 + 5 + \frac{5^2}{2} + \frac{5^3}{3!} + \frac{5^4}{4!} +$

Sum	Determine which value the series converges to. (Determine the value of the series/Determine the sum of the series)
	A) $\sum_{n=0}^{\infty} \left(\frac{4}{5}\right)^n$ geometric; 1st term = 1; $r = \frac{4}{5}$; $= f(x) = \frac{1}{1-\frac{4}{5}} = \frac{1}{\left(\frac{1}{5}\right)} = 5$
	B) $\sum_{n=0}^{\infty} \frac{5^n}{n!} = e^5$; $e^x = \sum \frac{x^n}{n!}$ $x = 5$
$2n+1 \to$ odds; $2n \to$ evens; $n \to$ all #'s	C) $\sum_{n=0}^{\infty} \frac{(-1)^n \left(\frac{\pi}{4}\right)^{2n+1}}{(2n+1)!}$; $\sin\left(\frac{\pi}{4}\right) = \frac{\sqrt{2}}{2}$
	D) $\sum_{n=0}^{\infty} \frac{(-1)^n \left(\frac{1}{2}\right)^{2n+1}}{2n+1}$; $\arctan\left(\frac{1}{2}\right)$