Find the error bound when using the 5th degree Taylor polynomial for sin at π to approximate sin 4.

$n=5$ $c=\pi$ $=x$

$$\underbrace{|R_n(x)|}_{\text{error}} \leq \underbrace{\frac{\max|f^{(n+1)}(z_x)|}{(n+1)!}}_{\text{"error bound"}} |x-c|^{n+1}$$

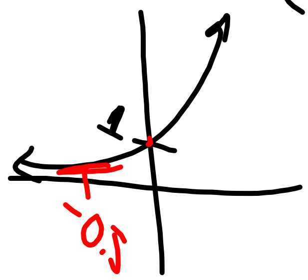
z_x is a # btwn x and c

$$\leq \frac{1}{6!}[4-\pi]^6 = 0.00056$$

3rd deg Mclaurin poly for e^x
to approx $e^{-0.5x}$

$$\text{error} \le \frac{1}{4!}\left|-0.5-0\right|^4$$

bound on 4th der of e^x, which is e^x.



$$\frac{5}{x-2} = \cdots = -\frac{5}{2}\,\frac{1}{\underbrace{1-\frac{1}{2}x}} = -\frac{5}{2}\sum_{n=0}^{\infty}\left(\frac{1}{2}x\right)^n$$

$$\sum_{n=0}^{\infty} r^n = \frac{1}{1-r} \Longrightarrow r = \frac{1}{2}x$$

converges for $\left|\frac{1}{2}x\right| < 1$

$\frac{1}{2}|x| < 1$

$|x| < 2$

IOC is $(-2,2)$

$$= -\frac{5}{2}\sum_{n=0}^{\infty}\frac{1}{2^n}x^n$$

$y' + 2xy = 0$ Assume that

$y = a_0 + a_1 x + a_2 x^2 + a_3 x^3 +$

$\underbrace{(\quad)}_{=0} + \underbrace{(\quad)}_{=0} x + \underbrace{(\quad)}_{=0} x^2 + \dots = 0$

$a_1 = 0$

$2a_2 + 2a_0 = 0$

$a_2 = -a_0$

$a_3 = 0$

$y = a_0 + a_1 x + a_2 x^2 + \dots$

$= \sum_{n=0}^{\infty} \frac{(-1)^n}{n!} x^{2n}$

$$\underbrace{\sin x =}\ x - \frac{1}{3!}x^3 + \cdots$$

$$\underbrace{\cos(-x) =}$$