P16

Find the first 5 non-zero terms & the general form for $f(x)=\sin x$ centered at $c=\frac{\pi}{2}$

Must use: $\frac{f^n(c)(x-c)^n}{n!}$

Can't Break Up $\sin(x-\frac{\pi}{2}+\frac{\pi}{2})$

$f(x)=\sin x \quad f(\pi/2)=1$

$f'(x)=\cos x \quad f'(\pi/2)=0$

$f^2(x)=-\sin x \quad f^2(\pi/2)=-1$

$f^3(x)=-\cos x \quad f^3(\pi/2)=0$

$f^4(x)=\sin x \quad f^4(\pi/2)=1$

$$T(x)=1-\frac{(x-\frac{\pi}{2})^2}{2!}+\frac{(x-\frac{\pi}{2})^4}{4!}-\frac{(x-\frac{\pi}{2})^6}{6!}+\frac{(x-\frac{\pi}{2})^8}{8!}$$

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