

HW 10.10

#7 $f(x) = \sin \pi x$ → WRITE A TAYLOR SERIES REPRESENTATION OF $f(x)$.

n	$f^{(n)}(x)$	$f^{(n)}(0)$
0	$\sin(\pi x)$	0
1	$\pi \cos(\pi x)$	π
2	$-\pi^2 \sin(\pi x)$	0
3	$-\pi^3 \cos(\pi x)$	$-\pi^3$
4	$\pi^4 \sin(\pi x)$	0

$$P(x) = \pi x + \frac{-\pi^3 x^3}{3!} + \frac{\pi^5 x^5}{5!} + \dots$$

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