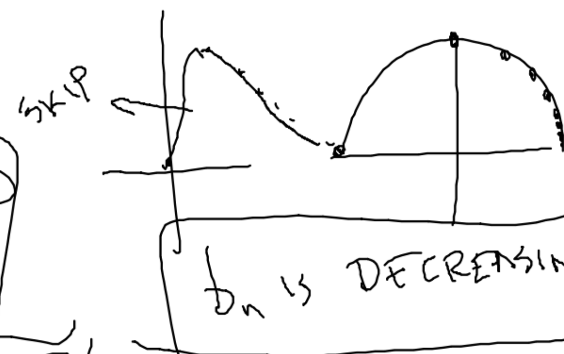
(17) $\sum_{n=1}^{\infty}(-1)^n \sin\frac{\pi}{n}$

$\boxed{b_n = \sin\frac{\pi}{n} > 0}$

$\sin\frac{\pi}{1}, \sin\frac{\pi}{2}, \sin\frac{\pi}{3}, \sin\frac{\pi}{4}, \ldots$

$\lim_{n\to\infty} b_n$



$\boxed{\lim_{n\to\infty} \sin\frac{\pi}{n} = \sin\frac{\pi}{\infty} = \sin 0 = 0}$

$\boxed{b_n \text{ IS DECREASING}}$

$\boxed{\text{CONVERGES BY A.S.T.}}$

(19) $\sum \underbrace{\boxed{(-1)^n \frac{n^n}{n!}}}_{a_n}$ $\quad b_n = \frac{n^n}{n!} = \frac{n \cdot n \cdot n \cdot n \cdot n \cdot n \cdots n}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdots n} > 0$

$b_1 = \frac{1}{1} \qquad b_2 = \frac{4}{2} \qquad b_3 = \frac{27}{6}$

$1 \qquad 2 \qquad \frac{9}{2}$ $\quad b_n$ IS INCREASING

↓

SO, WE CAN'T USE THE ALTERNATING SERIES TEST

$$\lim_{n\to\infty} \frac{n^n}{n!} = \infty$$

DIVERGES n^{th} TERM TEST (TEST FOR DIVERGENCE)

(25) $\sum_{n=0}^{\infty} \frac{(-1)^n}{10^n n!}$

$b_n = \frac{1}{10^n n!} > 0$ b_n IS DECREASING

$\lim_{n\to\infty} \frac{1}{10^n n!} = \frac{1}{\infty} = 0$ CONVERGES BY A.S.T.

$|r| < 0.000005$

$0! = 1$

$1! = 1$

n	a_n
0	1
1	$-1/10 = -0.1$
2	$1/200 = 0.02$
3	$-1/6000 = -0.0001\overline{6}$

$\frac{(-1)^4}{10^4 \cdot 4!} = \frac{1}{10000 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$

n	a_n
4	$1/240{,}000$

$= 0.00000041\overline{6} = \frac{1}{240000}$

$\boxed{\text{ADD } 1^{st}\ 4 \text{ TERMS}}$