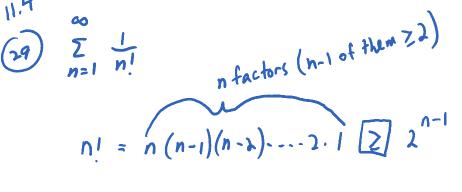
(i)
(i)
$$\sum_{n=0}^{\infty} \frac{\sin[n+\frac{1}{2}]\pi}{1+\sqrt{n}}$$
 thuse brackets
(i) $\sum_{n=0}^{\infty} \frac{\sin[n+\frac{1}{2}]\pi}{1+\sqrt{n}}$ alternates
Note that $\sin[(n+\frac{1}{2})\pi]$ alternates
between $1 \text{ and } -1$ for $n = 0, 1, 2, 3, ...$
So, this is an alternating series
with $bn = \frac{1}{1+\sqrt{n}} > 0$.
(i) $1 > \frac{1}{2} > \frac{1}{1+\sqrt{3}} > ...$
So, b_n decreases
(i) $\frac{1}{1+\sqrt{n}} \rightarrow 0$.
So, the series converges by AST

•



$$50, \quad 0 \leq \frac{1}{n!} \leq \frac{1}{2^{n-1}}$$

Now,
$$\sum_{n=1}^{\infty} \frac{1}{2^{n-1}} = \sum_{n=1}^{\infty} {\binom{1}{r}}^{n-1}$$
 is
a convergent geometric series $(-1 < r = \frac{1}{2} < 1)$.
So $\sum_{n=1}^{\infty} \frac{1}{r}$ converses by comparison.