

x

(4)

$$\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{8^n}$$

$$\frac{1}{8} - \frac{1}{8^2} + \frac{1}{8^3} - \frac{1}{8^4} \dots$$

$$a_n = \frac{a}{1-r}$$

$$= \frac{1}{1-\frac{1}{8}}$$

$$= -\frac{1}{8} \times \frac{8}{7}$$

$$= -\frac{1}{8}$$

$$\text{Sum} = -\frac{1}{8}$$

due to the absolute convergence  
and geometric series test  
it converges  $|r| = |-\frac{1}{8}| = \frac{1}{8} < 1$  so converge