$$
\text { (1) a) } \begin{aligned}
1+\frac{1}{3} & +\frac{1}{9}+\frac{1}{27}+\cdots \\
a=1 \quad S_{n} & =\frac{a}{1-r} \\
r=\frac{1}{3} & =\frac{1}{1-\frac{1}{3}} \\
& =\frac{1}{\frac{3}{3}-\frac{1}{3}} \\
& =\frac{1}{\frac{2}{3} 2} \\
& =1 \times \frac{3}{2}=\frac{3}{2}
\end{aligned}
$$

$$
\begin{aligned}
& \text { c) } \frac{1}{4}-\frac{5}{16}+\frac{25}{64}-\frac{125}{266}+\cdots \\
& a=\frac{1}{4} \quad \text { Diverging } \\
& r=-\frac{5}{4} \quad \lim _{n \rightarrow \infty}\left(\frac{1}{4}\right)\left(-\frac{5}{4}\right)^{n-1}=D N E \\
& t_{n}=\left(\frac{1}{4}\right)\left(\frac{5}{4}\right)^{n-1} \\
& \text { (2) b) } \sum_{n=1}^{\infty}\left(-\frac{2}{5}\right)^{n} \\
& \text { series } \\
& \frac{-2}{5}+\frac{4}{25}-\frac{8}{125} \\
& a=\frac{-2}{5} \quad \sigma_{n}=\frac{\frac{-2}{5}}{1+\frac{2}{5}}=\frac{\frac{-2}{3}}{\frac{7.5}{5}}=\frac{-2}{5}, \frac{6}{7} \\
& r=-\frac{2}{5} \\
& =\frac{-10}{35} \\
& =\frac{-2}{7}
\end{aligned}
$$

