

Name: \_\_\_\_\_

1. Find the 3rd partial sum of the series  $\sum_{n=1}^{\infty} \frac{1}{3^n}$ . You don't have to simplify your answer.

$$s_3 = \sum_{i=1}^3 \frac{1}{3^i} = \boxed{\frac{1}{3} + \frac{1}{9} + \frac{1}{27}}$$

2. Let  $s_n$  be the  $n$ th partial sum of the series  $\sum_{n=1}^{\infty} a_n$ . Suppose that  $\lim_{n \rightarrow \infty} s_n = 4$ .

(a) What is the sum of the series?

4

(b) What is  $\lim_{n \rightarrow \infty} a_n$ ?

0

3. Determine whether the series  $\sum_{n=1}^{\infty} \frac{1}{3^n}$  converges or diverges. If it converges, find its sum.

$$\sum_{n=1}^{\infty} \frac{1}{3^n} = \sum_{n=1}^{\infty} \frac{1}{3} \left(\frac{1}{3}\right)^{n-1} \quad \text{The series is geometric.}$$

$$r = \frac{1}{3}, \quad \text{so } |r| = \frac{1}{3} < 1 \quad \text{and the series } \boxed{\text{converges}}$$

$$\text{The sum is } \frac{a}{1-r} = \frac{\frac{1}{3}}{1-\frac{1}{3}} = \boxed{\frac{1}{2}}$$