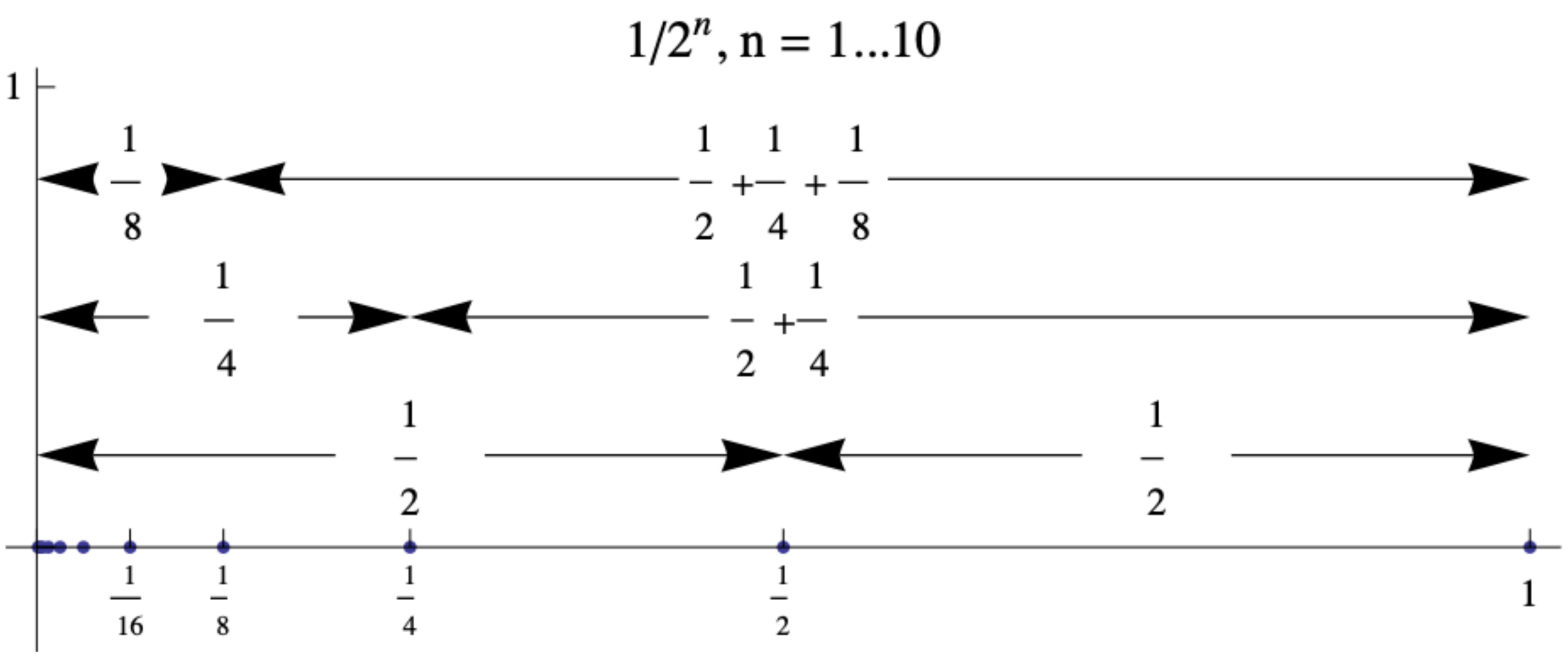
determine convergence/divergence using limit if S_n


$1/2^n$, n = 1...10
1
1/8
1/2 + 1/4 + 1/8
1/4
1/2 + 1/4
1/2
1/2
1/16
1/8
1/4
1/2
1

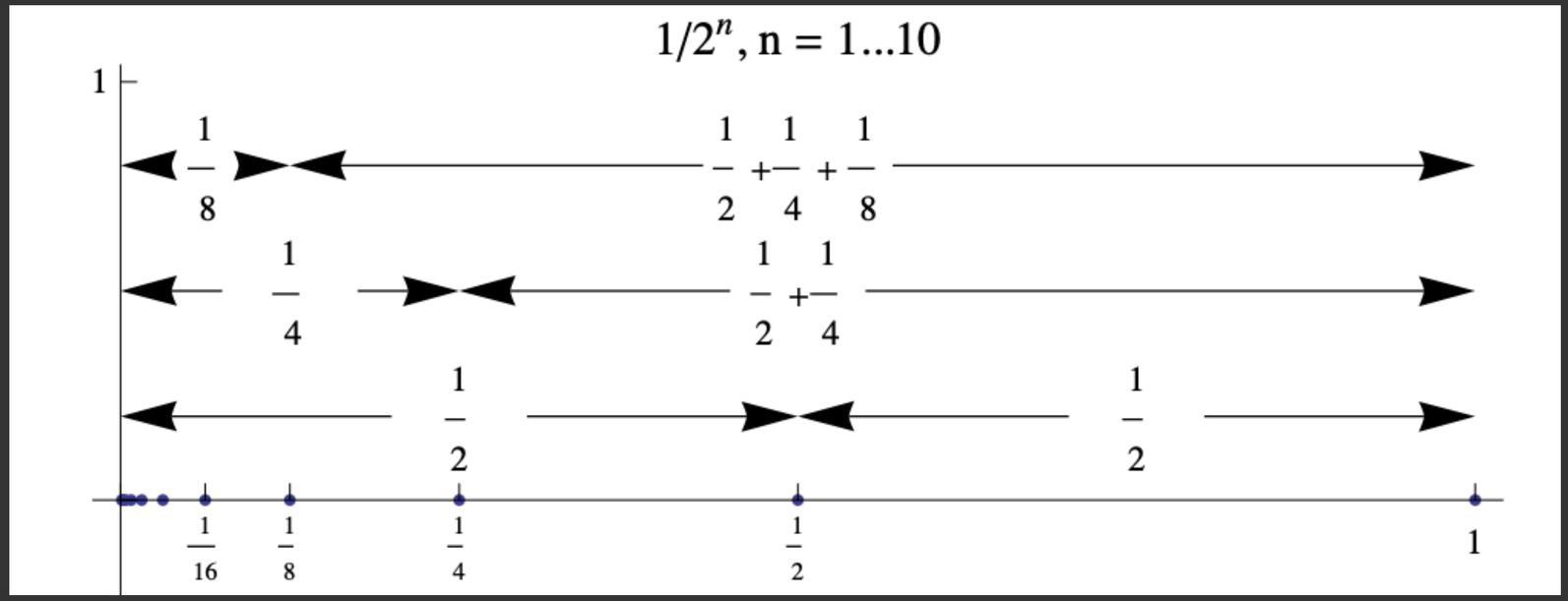
example

determine convergence/divergence using limit if s_n

example

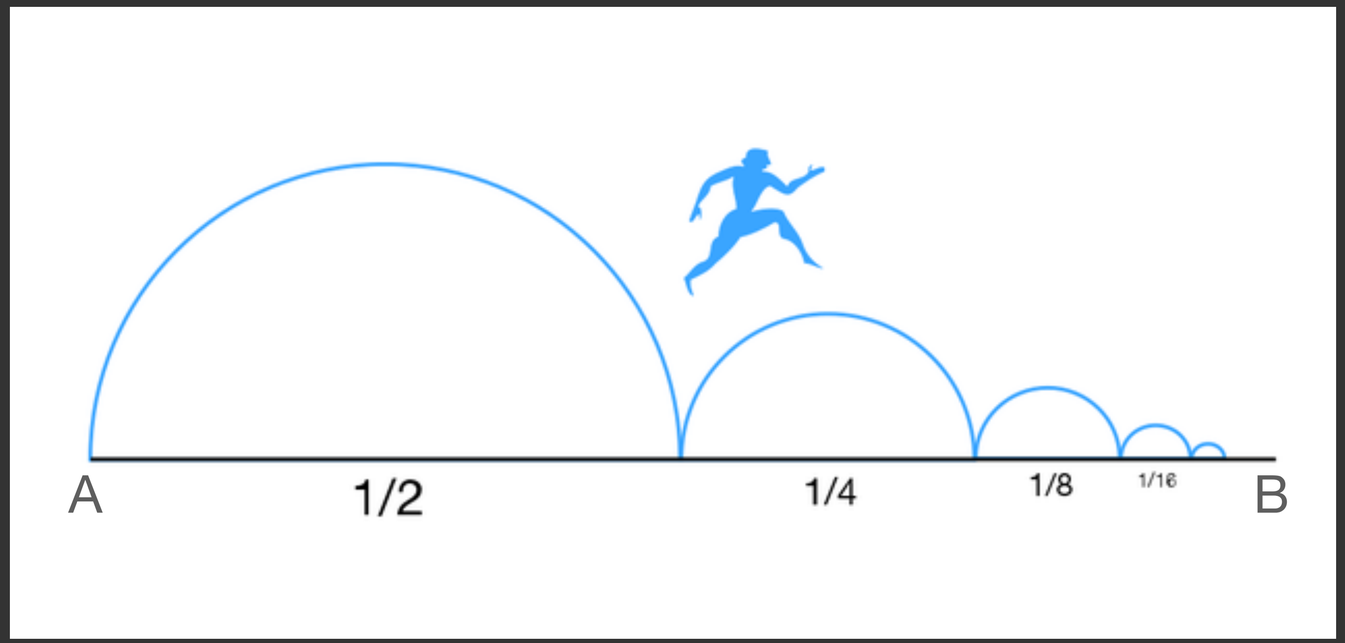
Find the partial sums $s_1, s_2, s_3, \ldots, s_n$ of the series $\sum_{n=1}^{\infty} \frac{1}{2^n}$. Find the sum of the series.

Does the series converge?



$$\sum_{n=1}^{\infty} \frac{1}{2^n} = \lim_{n\to\infty} s_n = \lim_{n\to\infty} \left(1 - \frac{1}{2^n}\right) = S = 1 \implies \text{converges}$$

Zeno's Paradox



- Consider a runner who is to complete a course from point A to point B.
- Imagine that the runner completes half the distance from A to B,
  and then completes half the remaining distance,
  and again half the remaining distance, and so on…
- Will the runner ever reach point B?