

Ex. 2 Does $0.999\dots$ converge to 1?

$$0.9 + 0.09 + 0.009 + \dots$$

$$\uparrow \quad \uparrow \quad \uparrow$$

$$9/10 + 9/100 + 9/1000 + \dots$$

$r = 1/10 \rightarrow$ convergent

$$S_{\infty} = \frac{a}{1-r}$$

$$S_{\infty} = \frac{9}{10} = \frac{9}{10}$$

$$S_{\infty} = 1$$

Ex. 3 To what exact number does $0.232323\dots$ converge?

$$0.23 + 0.0023 + 0.000023 + \dots$$

$$\frac{23}{100} + \frac{23}{10000} + \frac{23}{1000000} + \dots$$

$$S_{\infty} = \frac{23}{100}$$

$$1 - \frac{1}{100}$$

$$S_{\infty} = \frac{23}{100}$$

$$\frac{99}{100}$$

$$S_{\infty} = \frac{23}{100} \times \frac{100}{99}$$

$$S_{\infty} = \frac{2300}{9900}$$

$$S_{\infty} = \frac{23}{99}$$

$$r = 1/100$$

$$t_1 = 23/100$$

Homework: p. 63-64 # 1-3, 6-8, 13, 15