

④ $0.9999\dots$

let $x = 0.99999\dots$... ①

mul. both sides by 10

$10x = 9.99999\dots$... ②

② - ①

$10x - x = 9.99999\dots - 0.99999\dots$

$\Rightarrow 9x = 9$

$\Rightarrow x = \frac{9}{9}$

$= 1$

$\therefore 0.9999\dots$ or $0.\overline{9} = 1$

For reasons visit

www.en.wikipedia/wiki/0.999...

questions similar to Q3 ex 1.4

3④ let $x = 0.3\overline{1}$

mul. both sides by 10

$10x = 3.\overline{1} \dots$ ①

mul. both sides by 10

$100x = 31.\overline{1} \dots$ ②

② - ①

$100x - 10x = 31.\overline{1} - 3.\overline{1}$

$\Rightarrow 90x = 28$

$\Rightarrow x = \frac{28}{90} = \frac{14}{45}$

$\therefore 0.3\overline{1} = \frac{14}{45}$

3④ let $x = 0.49\overline{8}$

Mul. both sides by 100

$100x = 49.\overline{8} \dots$ ①

Mul. both sides by 10

$1000x = 498.\overline{8} \dots$ ②

② - ①

$1000x - 100x = 498.\overline{8} - 49.\overline{8}$

$\Rightarrow 900x = 449$

$\Rightarrow x = \frac{449}{900}$