④ $0.9999\ldots$

let $x = 0.99999\ldots$ ...①

mul. both sides by 10

$10x = 9.99999\ldots$ ...②

② − ①

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

$\Rightarrow 9x = 9$

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

$= 1$

$\therefore 0.9999\ldots$ or $0.\bar{9} = 1$

For reasons visit
www.en.wikipedia/wiki/0.999...

questions similar to Q3 ex 1.4

3(iv) let $x = 0.3\bar{1}$

mul. both sides by 10

$10x = 3.\bar{1}$ ...①

mul. both sides by 10

$100x = 31.\bar{1}$ ...②

② − ①

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

$\Rightarrow 90x = 28$

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

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

3(v) let $x = 0.49\bar{8}$

Mul. both sides by 100

$100x = 49.\bar{8}$ ...①

Mul. both sides by 10

$1000x = 498.\bar{8}$ ...②

② − ①

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

$\Rightarrow 900x = 449$

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