

Assignment 4

- 1 Show $\lim_{x \rightarrow a} (x^2) = a^2$.
- 2 Show $\lim_{x \rightarrow 1} \left(\frac{1}{x}\right) = 1$.
- 3 Let $f : (0, \infty) \rightarrow \mathbb{R}$ be the function defined by

$$f(x) = \sqrt{x} \quad (\text{the positive square root of } x)$$

Show $\lim_{x \rightarrow a} f(x) = \sqrt{a} \quad \forall a \in (0, \infty)$

4 Let $f(x) = \begin{cases} 0 & \text{if } x < 0 \\ 2 & \text{if } x > 0 \end{cases}$.

Show that $\lim_{x \rightarrow 0} f(x)$ does not exist.