1. Suppose that the function $f$ is defined for all values of $x$ excluding 1 with the formula

$$f(x) = \frac{x^2 - 1}{x - 1}$$

(a) Find the continuous function $g$, defined for all values of $x$, which agrees with $f$ for all values where $f$ is defined.

$$g(x) = x + 1$$ \hspace{1cm} \text{Ans.}$$

(b) Use the result from part (a) to compute

$$\lim_{x \to 1} \frac{x^2 - 1}{x - 1} = 2$$

Remember: the definition of $\lim_{x \to a} f(x)$ does not involve the value of the function $f$ at $a$, i.e. $f(a)$.

So, since $g(x) = f(x)$ except at $x = a$, $(a = 1)$ then

$$\lim_{x \to 1} g(x) = 2 = \lim_{x \to 1} f(x)$$.