

Values

[6] 1. Evaluate the limit (or explain why it does not exist).

$$(a) \lim_{t \rightarrow 1} \frac{t-1}{\sqrt{t^2+t}-\sqrt{2t}} =$$

$$= \lim_{t \rightarrow 1} \frac{t-1}{\sqrt{t^2+t}-\sqrt{2t}} \cdot \frac{\sqrt{t^2+t} + \sqrt{2t}}{\sqrt{t^2+t} + \sqrt{2t}} =$$

$$= \lim_{t \rightarrow 1} \frac{(t-1)(\sqrt{t^2+t} + \sqrt{2t})}{t(t-1)} =$$

$$= \lim_{t \rightarrow 1} \frac{\sqrt{t^2+t} + \sqrt{2t}}{t} = \frac{\sqrt{2} + \sqrt{2}}{1} = 2\sqrt{2}$$

$$[6] (b) \lim_{x \rightarrow 2^-} \frac{|x-2|}{x^2-2x} =$$

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

$$[6] (c) \lim_{x \rightarrow \infty} \sqrt{x^2+1000} - x =$$

$$= \lim_{x \rightarrow \infty} \frac{(\sqrt{x^2+1000} - x)(\sqrt{x^2+1000} + x)}{\sqrt{x^2+1000} + x} =$$

$$= \lim_{x \rightarrow \infty} \frac{1000}{\sqrt{x^2+1000} + x} = 0$$