

$$1b) \lim_{x \rightarrow \infty} \sqrt{x^2 + 2x} - x \quad 1c) \lim_{x \rightarrow 0^+} \frac{\sqrt{1/x}}{1/x}$$

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

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

$$= \lim_{x \rightarrow \infty} \frac{2}{x} \cdot \frac{1}{\left(\sqrt{\frac{1}{x^2} + \frac{2}{x}} + 1 \right)}$$

$$= \lim_{x \rightarrow \infty} \frac{2}{x} \cdot \frac{x}{\left(\sqrt{1 + 2x} + 1 \right)}$$

$$= \lim_{x \rightarrow \infty} 2 \cdot \frac{1}{\sqrt{1 + 2x} + 1}$$

$$= 2 \lim_{x \rightarrow \infty} \frac{1}{\sqrt{1 + 2x} + 1}$$

$$= 2 \lim_{x \rightarrow \infty} \frac{1}{\sqrt{1 + 2x} + 1}$$

$$= 2 \cdot \frac{1}{2}$$

$$= 1$$

$$\lim_{x \rightarrow 0^+} \frac{\sqrt{1/x}}{1/x}$$

$$= \lim_{x \rightarrow 0^+} \frac{\sqrt{1/x}}{1/x}$$

$$= \lim_{x \rightarrow 0^+} x \cdot \frac{1}{\sqrt{x}}$$

$$= \lim_{x \rightarrow 0^+} \sqrt{x}$$

$$= 0$$