

$$\lim_{x \rightarrow 0} \frac{\sqrt{2+x} - \sqrt{2}}{x}$$

$$\frac{(\sqrt{2+x} - \sqrt{2})}{x} \cdot \frac{(\sqrt{2+x} + \sqrt{2})}{(\sqrt{2+x} + \sqrt{2})} = \frac{2+x-\cancel{2}}{x\sqrt{2+x} + x\sqrt{2}}$$

$$\frac{x}{x(\sqrt{2+x} + \sqrt{2})} = \frac{1}{\sqrt{2+x} + \sqrt{2}}$$

$$\frac{1}{\sqrt{2+0} + \sqrt{2}} = \frac{1}{2\sqrt{2}} \quad \text{OR} \quad \frac{\sqrt{2}}{4}$$

$$f) \lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 - x^2}{\Delta x}$$

$$\frac{x^2 + 2x\Delta x + (\Delta x)^2 - \cancel{x^2}}{\Delta x} = \frac{2x\Delta x + (\Delta x)^2}{\Delta x}$$

$$\frac{\cancel{\Delta x}(2x + \Delta x)}{\cancel{\Delta x}} = \begin{matrix} 2x + \Delta x \\ 2x + 0 \\ \boxed{2x} \end{matrix}$$