

$$1b) \lim_{x \rightarrow -4} (x + 3)^2 = (-4 + 3)^2 = 1$$

$$1c) \lim_{x \rightarrow 7} \frac{3x}{\sqrt{x+2}} = \frac{3(7)}{\sqrt{7+2}} = \frac{21}{3} = 7$$

$$\begin{aligned} 2b) \lim_{x \rightarrow -3} \frac{x^2 + x - 6}{x^2 - 9} &= \lim_{x \rightarrow -3} \frac{(x+3)(x-2)}{(x+3)(x-3)} \\ &= \lim_{x \rightarrow -3} \frac{x-2}{x-3} = \frac{-5}{-6} = \frac{5}{6} \end{aligned}$$

$$\begin{aligned} 3b) \lim_{x \rightarrow 4} \frac{\sqrt{x+5} - 3}{x-4} &= \lim_{x \rightarrow 4} \frac{\sqrt{x+5} - 3}{x-4} \cdot \frac{\sqrt{x+5} + 3}{\sqrt{x+5} + 3} \\ &= \lim_{x \rightarrow 4} \frac{(x+5) - 9}{(x-4)(\sqrt{x+5} + 3)} \\ &= \lim_{x \rightarrow 4} \frac{1}{\sqrt{x+5} + 3} = \frac{1}{\sqrt{9} + 3} = \frac{1}{6} \end{aligned}$$

$$\begin{aligned} 4b) \lim_{x \rightarrow 0} \frac{\frac{1}{2+x} - \frac{1}{2}}{x} &= \lim_{x \rightarrow 0} \frac{2 - (2+x)}{2(2+x)} \cdot \frac{1}{x} \\ &= \lim_{x \rightarrow 0} \frac{-x}{2(2+x)} \cdot \frac{1}{x} \\ &= \lim_{x \rightarrow 0} \frac{-1}{2(2+x)} = -\frac{1}{4} \end{aligned}$$

$$\begin{aligned} 5b) \lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 - 2(x + \Delta x) + 1 - (x^2 - 2x + 1)}{\Delta x} &= \lim_{\Delta x \rightarrow 0} \frac{x^2 + 2x\Delta x + (\Delta x)^2 - 2x - 2\Delta x + 1 - x^2 + 2x - 1}{\Delta x} \\ &= \lim_{\Delta x \rightarrow 0} (2x + \Delta x - 2) = 2x - 2 \end{aligned}$$