

$$\begin{aligned}
 \text{1a)} \quad & \lim_{x \rightarrow -3} (x^2 + 3x) \\
 &= (-3)^2 + 3(-3) \\
 &= 9 - 9 = 0
 \end{aligned}$$

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

$$\text{1c)} \quad \lim_{x \rightarrow 7} \frac{3x}{\sqrt{x+2}}$$

$$\text{2a)} \quad \lim_{x \rightarrow 2} \frac{x^3 - 8}{x - 2}$$

$$\text{2b)} \quad \lim_{x \rightarrow -3} \frac{x^2 + x - 6}{x^2 - 9}$$

$$= \lim_{x \rightarrow 2} \frac{(x-2)(x^2 + 2x + 4)}{x-2}$$

$$= \lim_{x \rightarrow 2} (x^2 + 2x + 4)$$

$$= ((2)^2 + 2 \cdot (2) + 4)$$

$$= 12$$

$$\text{3a)} \quad \lim_{x \rightarrow 0} \frac{\sqrt{x+5} - \sqrt{5}}{x}$$

$$\text{3b)} \quad \lim_{x \rightarrow 4} \frac{\sqrt{x+5} - 3}{x-4}$$

$$= \lim_{x \rightarrow 0} \frac{\sqrt{x+5} - \sqrt{5}}{x} \cdot \frac{\sqrt{x+5} + \sqrt{5}}{\sqrt{x+5} + \sqrt{5}}$$

$$= \lim_{x \rightarrow 0} \frac{(x+5) - 5}{x(\sqrt{x+5} + \sqrt{5})}$$

$$= \lim_{x \rightarrow 0} \frac{1}{\sqrt{x+5} + \sqrt{5}}$$

$$= \frac{1}{2\sqrt{5}} = \frac{\sqrt{5}}{10}$$

$$\begin{aligned}
 \text{4a)} \quad & \lim_{x \rightarrow 0} \frac{[1/(3+x)] - (1/3)}{x} \\
 &= \lim_{x \rightarrow 0} \frac{\frac{1}{3+x} - \frac{1}{3}}{x} \\
 &= \lim_{x \rightarrow 0} \frac{3 - (3+x)}{(3+x)3(x)} \\
 &= \lim_{x \rightarrow 0} \frac{-x}{(3+x)(3)(x)} \\
 &= \lim_{x \rightarrow 0} \frac{-1}{(3+x)3} = -\frac{1}{9}
 \end{aligned}$$

$$\text{4b)} \quad \lim_{x \rightarrow 0} \frac{[1/(2+x)] - (1/2)}{x}$$

$$\begin{aligned}
 \text{5a)} \quad & \lim_{\Delta x \rightarrow 0} \frac{2(x + \Delta x) - 2x}{\Delta x} \\
 &= \lim_{\Delta x \rightarrow 0} \frac{2x + 2\Delta x - 2x}{\Delta x} \\
 &= \lim_{\Delta x \rightarrow 0} 2 = 2
 \end{aligned}$$

$$\text{5b)} \quad \lim_{\Delta x \rightarrow 0} \frac{(x + \Delta x)^2 - 2(x + \Delta x) + 1 - (x^2 - 2x + 1)}{\Delta x}$$