

§4.6

#262

$$\lim_{x \rightarrow \infty} \frac{2x-5}{4x} = \lim_{x \rightarrow \infty} \left( \frac{2x-5}{4x} \right) \left( \frac{\frac{1}{x}}{\frac{1}{x}} \right)$$

$$= \lim_{x \rightarrow \infty} \frac{2 - \cancel{5/x} \rightarrow 0}{4} = \frac{1}{2}$$

#264

$$\lim_{x \rightarrow \infty} \frac{3x}{\sqrt{x^2+1}} = \lim_{x \rightarrow \infty} \frac{3x}{\sqrt{x^2+1}} \left( \frac{\frac{1}{x}}{\frac{1}{x}} \right) = \lim_{x \rightarrow \infty} \frac{3}{\sqrt{1 + \frac{1}{x^2} \rightarrow 0}} = 3$$

§4.8

#356

$$\lim_{x \rightarrow \infty} \frac{e^x}{x} \xrightarrow{\infty} \text{L.H.} \lim_{x \rightarrow \infty} \frac{e^x}{1} = \infty \text{ (diverge)}$$

#368

$$\lim_{x \rightarrow 3} \frac{x^2-9}{x+3} = \frac{0}{6} = 0$$

#370

$$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos(x)}{\frac{\pi}{2}-x} \xrightarrow{\frac{0}{0}} \text{L.H.} \lim_{x \rightarrow \frac{\pi}{2}} \frac{-\sin(x)}{-1} = \sin(\frac{\pi}{2}) = 1$$