

$$\text{a) } \lim_{x \rightarrow 5} \frac{x^2 - 10x + 25}{x^2 - 7x + 10} = \frac{0}{0} = \lim_{x \rightarrow 5} \frac{(x-5)^2}{(x-5)(x-2)} = \lim_{x \rightarrow 5} \frac{x-5}{x-2} = 0$$

$$\text{b) } \lim_{x \rightarrow -1} \frac{x^2 - 1}{x^2 + 4x + 3} = \frac{0}{0} = \lim_{x \rightarrow -1} \frac{(x+1)(x-1)}{(x+1)(x+3)} = \lim_{x \rightarrow -1} \frac{x-1}{x+3} = -1$$

$$\text{c) } \lim_{x \rightarrow \infty} \frac{5x^2 - 8x + 7}{3x^2 - 2x} = \frac{\infty}{\infty} = \frac{5}{3}$$

$$\text{d) } \lim_{x \rightarrow 4} \frac{x-2}{x^2-16} = \frac{2}{0} = \left\{ \begin{array}{l} \lim_{x \rightarrow 4^+} \frac{x-2}{x^2-16} = \frac{+}{-} = -\infty \\ \lim_{x \rightarrow 4^-} \frac{x-2}{x^2-16} = \frac{+}{+} = +\infty \end{array} \right\} \neq$$

$$\text{e) } \lim_{x \rightarrow +\infty} \left(\frac{x^2 - 7}{x-1} - 5x \right) = \infty - \infty = \lim_{x \rightarrow +\infty} \frac{x^2 - 7 - 5x^2 + 5x}{x-1} = \lim_{x \rightarrow +\infty} \frac{-4x^2 + 5x - 7}{x-1} = \frac{\infty}{\infty} = -\infty$$

$$\text{f) } \lim_{x \rightarrow \infty} \frac{2x-1}{3x^2+5} = \frac{\infty}{\infty} = 0$$

$$\text{g) } \lim_{x \rightarrow 0} \frac{x^2 + x}{x} = \frac{0}{0} = \lim_{x \rightarrow 0} \frac{x(x+1)}{x} = 1$$

$$\text{h) } \lim_{x \rightarrow \infty} \left(\frac{x^2}{x-7} - \frac{x^2}{x+4} \right) = \infty - \infty = \lim_{x \rightarrow \infty} \frac{x^2(x+4) - x^2(x-7)}{x^2 - 3x - 28} = \lim_{x \rightarrow \infty} \frac{x^3 + 4x^2 - x^3 + 7x^2}{x^2 - 3x - 28} =$$

$$= \lim_{x \rightarrow \infty} \frac{11x^2}{x^2 - 3x - 28} = \frac{\infty}{\infty} = 11$$

$$\text{i) } \lim_{x \rightarrow -5} \frac{7x}{x+5} = \frac{-35}{0} = \left\{ \begin{array}{l} \lim_{x \rightarrow -5^-} \frac{7x}{x+5} = \frac{-}{-} = +\infty \\ \lim_{x \rightarrow -5^+} \frac{7x}{x+5} = \frac{-}{+} = -\infty \end{array} \right\} \neq$$

$$\text{j) } \lim_{x \rightarrow -7} \frac{x^2 + 6x - 7}{x^2 + 9x + 14} = \frac{0}{0} = \lim_{x \rightarrow -7} \frac{(x+7)(x-1)}{(x+7)(x+2)} = \lim_{x \rightarrow -7} \frac{x-1}{x+2} = \frac{8}{5}$$