

①

$$\lim_{x \rightarrow -\infty} \frac{7x^2 - 3x + 2}{3x^2 + 8} = \lim_{x \rightarrow -\infty} \frac{x^2 \left(7 - \frac{3}{x} + \frac{2}{x^2}\right)}{x^2 \left(3 + \frac{8}{x^2}\right)}$$

$$= \lim_{x \rightarrow -\infty} \left(\frac{7 - \frac{3}{x} + \frac{2}{x^2}}{3 + \frac{8}{x^2}} \right)$$

$$= \frac{7}{3}$$

$$\textcircled{2} \quad \lim_{x \rightarrow -1} \frac{x^2 - 1}{x + 1} = \lim_{x \rightarrow -1} \frac{(x-1)(x+1)}{x+1}$$

$$= \lim_{x \rightarrow -1} (x-1)$$

$$= -2$$

$$(3) \lim_{x \rightarrow -1} \frac{x}{x+1} = \frac{-1}{0} = \infty$$

$$(4) \lim_{x \rightarrow 0} \frac{|x|}{x} = \frac{0}{0} = 0$$

$$(5) \lim_{x \rightarrow 0} \frac{(x)^2}{(1 - \sqrt{1-x})} = \lim_{x \rightarrow 0} \frac{x^2}{1 - (1-x)}$$

$$\lim_{x \rightarrow 0} \frac{x^2}{1 - 1 + x} = \lim_{x \rightarrow 0} \frac{x^2}{x} = \lim_{x \rightarrow 0} x = 0$$

$$(6) \lim_{h \rightarrow 0} \frac{(1+h)^2 - 1}{h} = \lim_{h \rightarrow 0} \frac{1 + 2h + h^2 - 1}{h}$$

$$= \lim_{h \rightarrow 0} \frac{2h + h^2}{h} = \lim_{h \rightarrow 0} \frac{h(2+h)}{h}$$

$$= \lim_{h \rightarrow 0} (h+2) = \underline{\underline{2}}$$

LIMITS WORKSHEET

$$\textcircled{7} f(x) = \begin{cases} 2-x^2 & \text{if } x \leq 1 \\ x & \text{if } x > 1 \end{cases}$$

L.H.S at $x=1$

$$= \lim_{h \rightarrow 0} f(1-h) = \lim_{h \rightarrow 0} (2-(1-h)^2)$$

$$= \lim_{h \rightarrow 0} (2(1)^2 + 2h - h^2) = 1$$

$$\text{R.H.S at } x=1 : \lim_{h \rightarrow 0} f(1+h) = \lim_{h \rightarrow 0} (1+h) = 1$$

As; L.H.S = R.H.S ; So $f(x)$ is Continuous.