1.1 Algebraic Limit Theorem

Rule 1.1.1 – Algebraic Limit Theorem of a Constant(ALTC). If $g(x) = a$, where A is a constant, then

$$\lim_{x \to c} [A] = A \tag{1.1}$$

$$\tag{1.2}$$

Rule 1.1.2 – Algebraic Limit Theorem of a Sum (ALTS). If both the limits $\lim_{x \to c} g(x) = L_1$ and $\lim_{x \to c} h(x) = L_2$ exist, then

$$\lim_{x \to c} \left[g(x) + h(x)\right] = \lim_{x \to c} g(x) + \lim_{x \to c} h(x) \tag{1.3}$$

$$\tag{1.4}$$

Rule 1.1.3 – Algebraic Limit Theorem of a Difference (ALTD). If both the limits $\lim_{x \to c} g(x) = L_1$ and $\lim_{x \to c} h(x) = L_2$ exist, then

$$\lim_{x \to c} \left[g(x) - h(x)\right] = \lim_{x \to c} g(x) - \lim_{x \to c} h(x) \tag{1.5}$$

$$\tag{1.6}$$

Rule 1.1.4 – Algebraic Limit Theorem of a Product (ALTPr). If both the limits $\lim_{x \to c} g(x) = L_1$ and $\lim_{x \to c} h(x) = L_2$ exist , then

$$\lim_{x \to c} \left[g(x) \cdot h(x)\right] = \lim_{x \to c} g(x) \cdot \lim_{x \to c} h(x) \tag{1.7}$$

$$\tag{1.8}$$

Rule 1.1.5 – Algebraic Limit Theorem of a Quotient (ALTQ). If both the limits $\lim_{x \to c} g(x) = L_1$ and

$\lim_{x \to c} h(x) = L_2$ exist and $L_2 \neq 0$, then

$$\lim_{x \to c} \left[\frac{g(x)}{h(x)} \right] = \frac{\lim_{x \to c} g(x)}{\lim_{x \to c} h(x)} \tag{1.9}$$

$$\tag{1.10}$$