

# LIMITS OF FUNCTIONS: ALGEBRAIC METHODS [SST 2.2]

**EX 2.2.1:** Let  $f(x) = 3x^2 - \cos(2x) + \frac{\pi}{\sqrt{x}}$ . Find: (a)  $\lim_{x \rightarrow \pi/12} f(x)$  (b)  $\lim_{x \rightarrow (\pi/12)^-} f(x)$  (c)  $\lim_{x \rightarrow (\pi/12)^+} f(x)$

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**EX 2.2.2:** Let  $f(x) = \frac{1}{x^2 - 5x + 4}$ . Find: (a)  $\lim_{x \rightarrow 1} f(x)$  (b)  $\lim_{x \rightarrow 1^-} f(x)$  (c)  $\lim_{x \rightarrow 1^+} f(x)$

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**EX 2.2.3:** Let  $H(w) = \frac{w^2 + w - 2}{w^2 - 5w + 6}$ . Find: (a)  $\lim_{w \rightarrow 2} H(w)$  (b)  $\lim_{w \rightarrow 2^-} H(w)$  (c)  $\lim_{w \rightarrow 2^+} H(w)$

**EX 2.2.4:** Let  $g(t) = \frac{-\sqrt{t} + 1}{1 - t}$ . Find: (a)  $\lim_{t \rightarrow 1} g(t)$  (b)  $\lim_{t \rightarrow 1^-} g(t)$  (c)  $\lim_{t \rightarrow 1^+} g(t)$

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**EX 2.2.5:** Let  $E(t) = \frac{t^2}{\sin^2 t}$ . Find: (a)  $\lim_{t \rightarrow 0} E(t)$  (b)  $\lim_{t \rightarrow 0^-} E(t)$  (c)  $\lim_{t \rightarrow 0^+} E(t)$

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**EX 2.2.6:** Let  $f(x) = \begin{cases} 2x - 10 & , \text{ if } x \leq 0 \\ \sqrt{x} & , \text{ if } x > 0 \end{cases}$ . Find: (a)  $\lim_{x \rightarrow 0^-} f(x)$  (b)  $\lim_{x \rightarrow 0^+} f(x)$  (c)  $\lim_{x \rightarrow 0} f(x)$