

$$\boxed{52} \lim_{x \rightarrow 5} [f(x) - g(x)] = 8 \quad \text{and} \quad \lim_{x \rightarrow 5} g(x) = 2, \text{ find}$$

$$a) \lim_{x \rightarrow 5} f(x)$$

$$\lim_{x \rightarrow 5} [f(x) - g(x)] = 8$$

$$\rightarrow \lim_{x \rightarrow 5} f(x) - \lim_{x \rightarrow 5} g(x) = 8$$

$$\lim_{x \rightarrow 5} f(x) - \frac{2}{+2} = \frac{8}{+2} \rightarrow \lim_{x \rightarrow 5} f(x) = 10$$

$$\boxed{\lim_{x \rightarrow 5} f(x) = 10}$$

$$b) \lim_{x \rightarrow 5} \{ [g(x)]^2 - f(x) \}$$

$$= \lim_{x \rightarrow 5} [g(x)]^2 - \lim_{x \rightarrow 5} f(x)$$

$$= 2^2 - 10 = 4 - 10 = \boxed{-6}$$

$$\boxed{54} S = S(x) = \frac{9}{x} + 10 + \frac{x}{4} \quad ; \quad x \geq 4$$

$$a) \lim_{x \rightarrow 4^+} S(x)$$

$$\begin{aligned} \rightarrow \lim_{x \rightarrow 4^+} \left[\frac{9}{x} + 10 + \frac{x}{4} \right] &= \frac{9}{4} + 10 + \frac{4}{4} \\ &= 2.25 + 10 + 1 \\ &= \boxed{13.25} \end{aligned}$$

$$b) \lim_{x \rightarrow 10} S(x) =$$

$$\begin{aligned} \rightarrow \lim_{x \rightarrow 10} \left[\frac{9}{x} + 10 + \frac{x}{4} \right] &= \frac{9}{10} + 10 + \frac{10}{4} = 0.9 + 10 + 2.5 \\ &= \boxed{13.4} \end{aligned}$$