Question 1:

(a)[5 points] Evaluate: $\lim_{x \to 25} \dfrac{5 - \sqrt{x}}{x - 25}$

(b)[5 points] Evaluate: $\lim_{x \to -4^-} \dfrac{4x + 16}{|x + 4|}$

Question 2:

(a)[5 points] Evaluate: $\lim_{x \to 3} \dfrac{\sqrt{x^2+16}-3}{x^2-3x-3}$

(b)[5 points] Evaluate: $\lim_{x \to -4} \dfrac{x^2+5x+4}{x^2-x-20}$

Question 3:

(a)[3 points] A rectangle has area 16 m^2. Express the perimeter P as a function of the length x of one of its sides.

(b)[3 points] Let $H(x) = \sec^2(\sqrt{x^2-1})$ and $h(x) = x^2$. Find functions f and g so that $H = f \circ g \circ h$. (There are several possible correct answers.)

(c)[4 points] Let $f(x) = \dfrac{1}{x^2}$ and $g(x) = \dfrac{x}{\sqrt{x+2}}$. Determine, simplify, and find the domain of $(f \circ g)(x)$.

Question 4:

(a)[5 points] Evaluate: $\lim_{x \to \pi} \frac{\sin^2\left(\frac{x}{2}\right)}{x - \pi}$

(b)[5 points] Let $f(x) = \frac{1}{x-3}$. Evaluate and simplify the difference quotient $\frac{f(a+h) - f(a)}{h}$.

Question 5:

(a)[5 points] Evaluate: $\lim_{t\to 0} \dfrac{\sin(5t)}{\tan(7t)}$

(b)[5 points] Evaluate: $\lim_{x\to 0} x^4 \sin\left(\dfrac{4}{x}\right)$
(the Squeeze Theorem may help here).