

Name (print): _____ Signature: _____

You have 30 minutes. Show your work. Notes, calculators not allowed! Problems are on both pages.

Problem 1. (5 pts) Find horizontal and vertical asymptotes (if any exist) for the function

$$f(x) = \frac{x^2 - x - 6}{2x^2 - 8}$$

Problem 2. (4 pts) For what values of the constant k is the following function continuous:

$$g(x) = \begin{cases} x^2 - kx - 1 & \text{for } x \leq 3 \\ -2x + 3k & \text{for } x > 3 \end{cases}$$

Problem 3. (3 pts) Find

$$\lim_{x \rightarrow 3} 4x^2 - 7x + \sin(x - 3).$$

Problem 4. (4 pts) Find

$$\lim_{x \rightarrow -\infty} \frac{3x + 7}{\sqrt{4x^2 - 9x + 1}}.$$

Problem 5. (4 pts) Find

$$\lim_{h \rightarrow 0} \frac{\sqrt{x + h + 1} - \sqrt{x + 1}}{h}$$