

Answer the questions in the spaces provided on the question sheets. If you run out of room for an answer, continue on the back of the page.

Name and section: _____

Instructor's name: _____

1. (1, probl. 1) Determine $\lim_{x \rightarrow -2} \frac{x+2}{|x+2|}$.

2. (1, probl. 9-29) Determine the following limits:

a) $\lim_{x \rightarrow 2} \frac{x-2}{x^2-4}$

b) $\lim_{x \rightarrow -2} \frac{x+2}{\sqrt{x^2-4}}$

c) $\lim_{x \rightarrow 0} \frac{e^{2x}}{x-2}$

d) $\lim_{x \rightarrow 0} \frac{\tan x}{\sec x}$

e) $\lim_{x \rightarrow 1} f(x)$, where $f(x) = 2x + 1$ for $x < 1$ and $f(x) = x^2 + 1$ for $x \geq 1$

f) $\lim_{x \rightarrow 2^+} \sqrt{x^2 - 4}$

g) $\lim_{x \rightarrow \infty} \frac{2x}{\sqrt{x^2+4}}$

h) $\lim_{x \rightarrow -\infty} e^{-x^2}$

i) $\lim_{x \rightarrow \infty} \ln 2x$

j) $\lim_{x \rightarrow -\infty} \frac{2x}{x^2+3x-5}$.

3. (1, probl. 30) Use the Intermediate Value Theorem to verify that $f(x) = x^3 - x - 1$ has a zero in the interval $[1, 2]$.

4. (1, probl. 33) Find all discontinuities of $f(x)$ and determine which are removable if $f(x) = \sin x$ for $x < 0$, $f(x) = x^2$ for $x \in [0, 2]$, and $f(x) = 4x - 3$ for $x > 2$.

5. (1, probl. 39) Determine all vertical and horizontal asymptotes of $f(x) = \frac{x+1}{x^2-3x+2}$.

6. (1, probl. 41) Determine all vertical and horizontal asymptotes of $f(x) = \frac{x^2}{x^2-1}$.