

Name:

A#:

1. Evaluate the following limits, if they exist. **Provide proper reasoning** for your answers.

(a) $\lim_{x \rightarrow \infty} \frac{3x^3 - x}{2x^3 - 5x^2 + 1}$

(b) $\lim_{x \rightarrow \pi} \frac{\tan 3x}{\sin 2x}$

(c) $\lim_{t \rightarrow 0} \frac{t^2 e^t}{2 \cos t - t^2 - 2}$

(d) $\lim_{x \rightarrow 0^-} e^{1/x} \ln x^2$

2. Consider the curve $y = \frac{\sqrt{2x^2 + 1}}{x - 1}$

(a) Find all vertical asymptotes. (Be sure to compute limits from the left and right of each.)

(b) Find all horizontal asymptotes. (Be sure to compute limits to both $+\infty$ and $-\infty$.)

(c) Find all local maxima and minima.

(d) Use (a)–(c) to sketch the curve. Label all asymptotes and local maxima/minima.