Find the following for $f(x) = \frac{x^2+3x}{x-1} = \frac{x(x+3)}{x-1}$ (if they exist; if they don't exist, state so). Use this information to graph f.

Note $f'(x) = \frac{(x-3)(x+1)}{(x-1)^2}$, $f''(x) = \frac{8}{(x-1)^3}$

[1.5] 1a.) critical numbers: $\underline{-1, 3}$

[1.5] 1b.) local maximum(s) occur at $x = \underline{-1}$

[1.5] 1c.) local minimum(s) occur at $x = \underline{-3}$

[1.5] 1d.) The global maximum of f on the interval [0, 5] is $\underline{none}$ and occurs at $x = \underline{none}$

[1.5] 1e.) The global minimum of f on the interval [0, 5] is $\underline{none}$ and occurs at $x = \underline{none}$

[1.5] 1f.) Inflection point(s) occur at $x = \underline{none}$

[1.5] 1g.) f increasing on the intervals $\underline{(-\infty, -1) \cup (3, \infty)}$

[1.5] 1h.) f decreasing on the intervals $\underline{(-1, 1) \cup (1, 3)}$

[1.5] 1i.) f is concave up on the intervals $\underline{(1, \infty)}$

[1.5] 1j.) f is concave down on the intervals $\underline{(-\infty, 1)}$

[1.5] 1k.) Equation(s) of vertical asymptote(s): $\underline{x = 1}$

[4] 1l.) Equation(s) of horizontal and/or slant asymptote(s): $\underline{y = x + 3}$

[4.5] 1m.) Graph f