Find the intervals on which f is increasing or decreasing, any relative extrema, and the intervals of concavity and inflection points.

$$f(x) = x^3 - 12x + 1$$

Interval(s) of Increase: $(-\infty, -2] \cup [2, \infty)$
Interval(s) of Decrease: $[-2, 2]$
Local Max: $x = 2$ Local Min: $x = -2$
Concave up: $(0, \infty)$ Concave down: $(-\infty, 0)$
Inflection Point: $x = 0$.

$$f(x) = \frac{x^2}{x^2 + 3}$$

Interval(s) of Increase: $[0, \infty)$
Interval(s) of Decrease: $(-\infty, 0]$
Local Min: $x = 0$
Concave up: $(-1, 1)$ Concave down: $(-\infty, -1) \cup$
$(1, \infty)$
Inflection Point: $x = -1, 1$.

Find all of the information that you need to graph the following functions and graph them.

$$f(x) = \frac{x^2 - 1}{x^3}$$

Domain: $x \neq 0$ Intercepts: $(-1, 0)$ and $(1, 0)$

V.A.: $x = 0$ H.A.: $y = 0$.

Interval(s) of Decrease: $(-\infty, -\sqrt{3}] \cup [\sqrt{3}, \infty)$

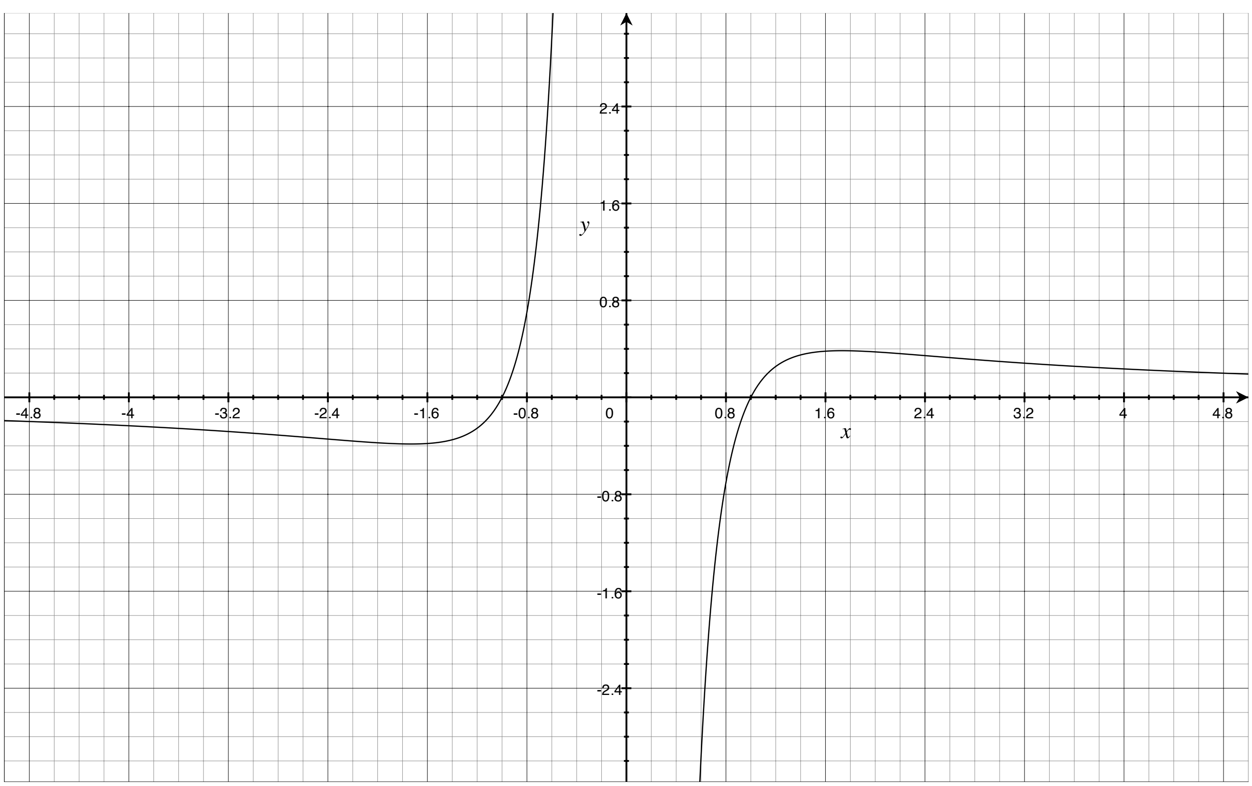
Interval(s) of Increase: $[-\sqrt{3}, 0) \cup (0, \sqrt{3}]$

Local Max: $x = \sqrt{3}$ Local Min: $x = -\sqrt{3}$

Concave up: $(-\sqrt{6}, 0) \cup (\sqrt{6}, \infty)$

Concave down: $(-\infty, -\sqrt{6}) \cup (0, \sqrt{6})$

Inflection Point: $x = -\sqrt{6}, \sqrt{6}$.



$$f(x) = x - 3x^{1/3}$$

Domain: $\mathbb{R}$ Intercepts: $(0, 0)$, $(-\sqrt{27}, 0)$, and $(\sqrt{27}, 0)$

Asymptotes: None.

But: $\lim_{x\to\infty} f(x) = +\infty$ $\lim_{x\to-\infty} f(x) = -\infty$.

Interval(s) of Decrease: $[-1, 1]$

Interval(s) of Increase: $(-\infty, -1] \cup [1, \infty)$

Local Max: $x = 1$ Local Min: $x = -1$

Concave up: $(0, \infty)$

Concave down: $(-\infty, 0)$

Inflection Point: $x = 0$.