1.) Let $f(x) = 8x^2 - x^4$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

2.) Let $f(x) = \dfrac{x}{(x-1)^2}$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

3.) Let $f(x) = \dfrac{1}{x^2 - 9}$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

4.) Let $f(x) = \dfrac{x}{x^2 + 9}$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

5.) Let $f(x) = \dfrac{x^3 - 1}{x^3 + 1}$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

6.) Let $f(x) = x - 3x^{\frac{1}{3}}$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

7.) Let $f(x) = x^{\frac{1}{3}}(x+4)$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

8.) Let $f(x) = \dfrac{x^2}{x^2 - 1}$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

9.) Let $f(x) = \dfrac{x^2}{(x-2)^2}$

a.) Find $f'(x)$.

b.) Find the critical numbers.

c.) Find the intervals upon which $f(x)$ is increasing and decreasing.

d.) Find any relative extrema.

e.) Find $f''(x)$.

f.) Determine the intervals upon which $f(x)$ is concave up and down.

g.) Determine the Vertical and Horizontal Asymptotes.

h.) Graph the function.

10.)   Let $f(t) = t + \cos t$

a.)   Find $f'(x)$.

b.)   Find the critical numbers.

c.)   Find the intervals upon which $f(x)$ is increasing and decreasing.

d.)   Find any relative extrema.

e.)   Find $f''(x)$.

f.)   Determine the intervals upon which $f(x)$ is concave up and down.

g.)   Determine the Vertical and Horizontal Asymptotes.

h.)   Graph the function.