Curve Sketching Examples

1. Given the following function and its derivatives

$$f(x) = \frac{2(x^2 - 9)}{x^2 - 4} \qquad f'(x) = \frac{20x}{(x^2 - 4)^2} \qquad f''(x) = \frac{-20(3x^2 + 4)}{(x^2 - 4)^3}$$

Fill in the following information about the function and its graph. Show all work and write "none", if applicable.

domain:	
x-intercept(s):	
y-intercept:	
vertical asymptote(s):	
horizontal asymptote(s):	
slant asymptote:	
critical numbers:	
intervals where increasing:	
intervals where decreasing:	
coordinates of local $\max/\min(s)$:	
intervals where concave up:	
intervals where concave down:	
Inflection Point(s):	

Sketch the graph of the function on the set of axes provided separately.

Curve Sketching Examples

2. Given the following function and its derivatives

$$f(x) = x\sqrt{x^2 - 4} \qquad f'(x) = \frac{2(x^2 - 2)}{\sqrt{x^2 - 4}} \qquad f''(x) = \frac{2x(x^2 - 6)}{(x^2 - 4)^{3/2}}$$

Fill in the following information about the function and its graph. Show all work and write "none", if applicable.

domain:	
x-intercept(s):	
y-intercept:	
vertical asymptote(s):	
horizontal asymptote(s):	
slant asymptote:	
critical numbers:	
intervals where increasing:	
intervals where decreasing:	
coordinates of local max/min(s):	
intervals where concave up:	
intervals where concave down:	
Inflection Point(s):	

Sketch the graph of the function on the set of axes provided separately.

Curve Sketching Examples

3. Given the following function and its derivatives

$$f(x) = \frac{x^2 - 3x + 9}{3 - x} \qquad f'(x) = \frac{-x(x - 6)}{(x - 3)^2} \qquad f''(x) = \frac{-18}{(x - 3)^3}$$

Fill in the following information about the function and its graph. Show all work and write "none", if applicable.

domain:	
x-intercept(s):	
y-intercept:	
vertical asymptote(s):	
horizontal asymptote(s):	
slant asymptote:	
critical numbers:	
intervals where increasing:	
intervals where decreasing:	
coordinates of local $\max/\min(s)$:	
intervals where concave up:	
intervals where concave down:	
Inflection Point(s):	

Sketch the graph of the function on the set of axes provided separately.

Sketch the graph of the function $f(x) = \frac{2(x^2 - 9)}{x^2 - 4}$ from Example 1. Label any maximum and minimum values and inflection points.



Sketch the graph of the function $f(x) = f(x) = x\sqrt{x^2 - 4}$ from Example 2. Label any maximum and minimum values and inflection points.

