Section 3.4 Curve sketching (Minimum Homework: 1, 3, 5, 13, 15, 21)

#1-6: For each function

a) Find the x-intercept(s), if any
b) Find the y-intercept, in there is one
c) Find the interval(s) where the graph of the function is increasing
d) Find the interval(s) where the graph of the function is decreasing
e) Find all relative maxima
f) Find all relative minima
g) Find the interval(s) where the graph of the function is concave up (if any)
h) Find the interval(s) where the graph of the function is concave down (if any)
i) Find all inflection points (if any)
j) Sketch a graph

1) $f(x) = x^3 - 3x^2$

2) $f(x) = 2x^3 - 12x^2$

3) $f(x) = x^3 - 27x$

4) $f(x) = 2x^3 - 54x$

5) $f(x) = x^4 - 4x^3$

6) $f(x) = 2x^4 - 8x^3$

#7-10: For each function

a) Find the domain

b) Find the equation of the vertical asymptote

c) Find the x-intercept(s), if any

d) Find the y-intercept, in there is one

e) Find all horizontal asymptotes

f) Find the interval(s) where the graph of the function is increasing

g) Find the interval(s) where the graph of the function is decreasing

h) Find all relative maxima and

i) Find all relative minima

j) Find the interval(s) where the graph of the function is concave up (if any)

k) Find the interval(s) where the graph of the function is concave down (if any)

l) Find all inflection points (if any)

m) Sketch a graph

7) $f(x) = \frac{3}{x-4}$ Hint: $f''(x) = \frac{-3}{(x-4)^2}$ $f''(x) = \frac{6}{(x-4)^3}$

8) $f(x) = \frac{2}{x-3}$ Hint: $f''(x) = \frac{-2}{(x-3)^2}$ $f''(x) = \frac{4}{(x-3)^3}$

9) $f(x) = \frac{x+2}{x-3}$ Hint: $f''(x) = \frac{-5}{(x-3)^2}$ $f''(x) = \frac{10}{(x-3)^3}$

10) $f(x) = \frac{x+1}{x+5}$ Hint: $f''(x) = \frac{4}{(x+5)^2}$ $f''(x) = \frac{-8}{(x+5)^3}$

#11-14: For each function

a) Find the x-intercept(s), if any

b) Find the y-intercept, in there is one

c) Find the interval(s) where the graph of the function is increasing

d) Find the interval(s) where the graph of the function is decreasing

e) Find all relative maxima

f) Find all relative minima

g) Find the interval(s) where the graph of the function is concave up (if any)

h) Find the interval(s) where the graph of the function is concave down (if any)

i) Find all inflection points (if any)

j) Sketch a graph

11) $f(x) = xe^x$ Hint: $f'(x) = e^x(x+1)$ $f"(x) = e^x(x+2)$

12) $f(x) = 3xe^x$ Hint: $f'(x) = 3e^x(x+1)$ $f"(x) = 3e^x(x+2)$

13) $f(x) = 2xe^x$ Hint: $f'(x) = 2e^x(x+1)$ $f"(x) = 2e^x(x+2)$

14) $f(x) = 4xe^x$ Hint: $f'(x) = 4e^x(x+1)$ $f"(x) = 4e^x(x+2)$