Hw 9

A) (60 points) Let \( f(x) = x^2(x+1)^2 \).

1) Find the intercepts.
2) Find all horizontal and vertical asymptotes.
3) Differentiate and simplify.
4) Find all points \( c \) where \( f'(c) = 0 \) or \( f'(c) \) does not exist; plot.
5) Find the second derivative of \( f \), and simplify.
6) Find all points \( c \) where \( f''(c) = 0 \) or \( f''(c) \) does not exist; plot.
7) Use the second derivative to find where \( f \) is concave up and concave down.
8) Graph \( f \).

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

1) (10 points) Find all intercepts
2) (10 points) Find all vertical and horizontal asymptotes
3) (15 points) Differentiate and simplify
4) (10 points) Find all \( c \) where \( f'(c) = 0 \) or \( f'(c) \) does not exist
5) (10 points) Find where \( f \) is increasing, decreasing
6) (15 points) Find the second derivative and simplify
7) (5 points) Find all \( c \) where \( f''(c) = 0 \) or \( f''(c) \) does not exist
8) (10 points) Find where \( f \) is concave up, down
9) (10 points) Plot the points in 1), 4), 7)
10) (5 points) Graph the function