1994 Paper II Question 10

Let $f(x) = \frac{\sqrt[3]{x^2}}{x+1}$, $x \in \mathbf{R}$.

a. (i) Evaluate $f'(x)$ for $x \neq 0$. Prove that $f'(0)$ does not exist.

(ii) Determine those values of x for which $f'(x) > 0$ and those values of x for which $f'(x) < 0$.

(iii) Find the relative extreme points of $f(x)$.

(8 marks)

b. (i) Evaluate $f''(x)$ for $x \neq 0$. Hence determine the points of inflexion of $f(x)$.

(ii) Find the asymptote of the graph of $f(x)$.

(4 marks)

c. Using the above results, sketch the graph of $f(x)$. (3 marks)