Let $f(x) = \sqrt[3]{x^2 - x^3}$.

a. Find $f'(x)$ and $f''(x)$. (2 marks)

b. Show that both $f'(0)$ and $f'(1)$ do not exist. (2 marks)

c. Determine the sets of values of x such that:

   (i) $f'(x) = 0$,

   (ii) $f'(x) > 0$,

   (iii) $f'(x) < 0$,

   (iv) $f''(x) = 0$,

   (v) $f''(x) > 0$,

   (vi) $f''(x) < 0$.

(3 marks)

d. Find the relative extremum point(s) and the point(s) of inflexion on the curve $y = f(x)$. (3 marks)

e. Find the asymptote(s) of the curve $y = f(x)$. (3 marks)

f. Sketch the curve $y = f(x)$. (2 marks)