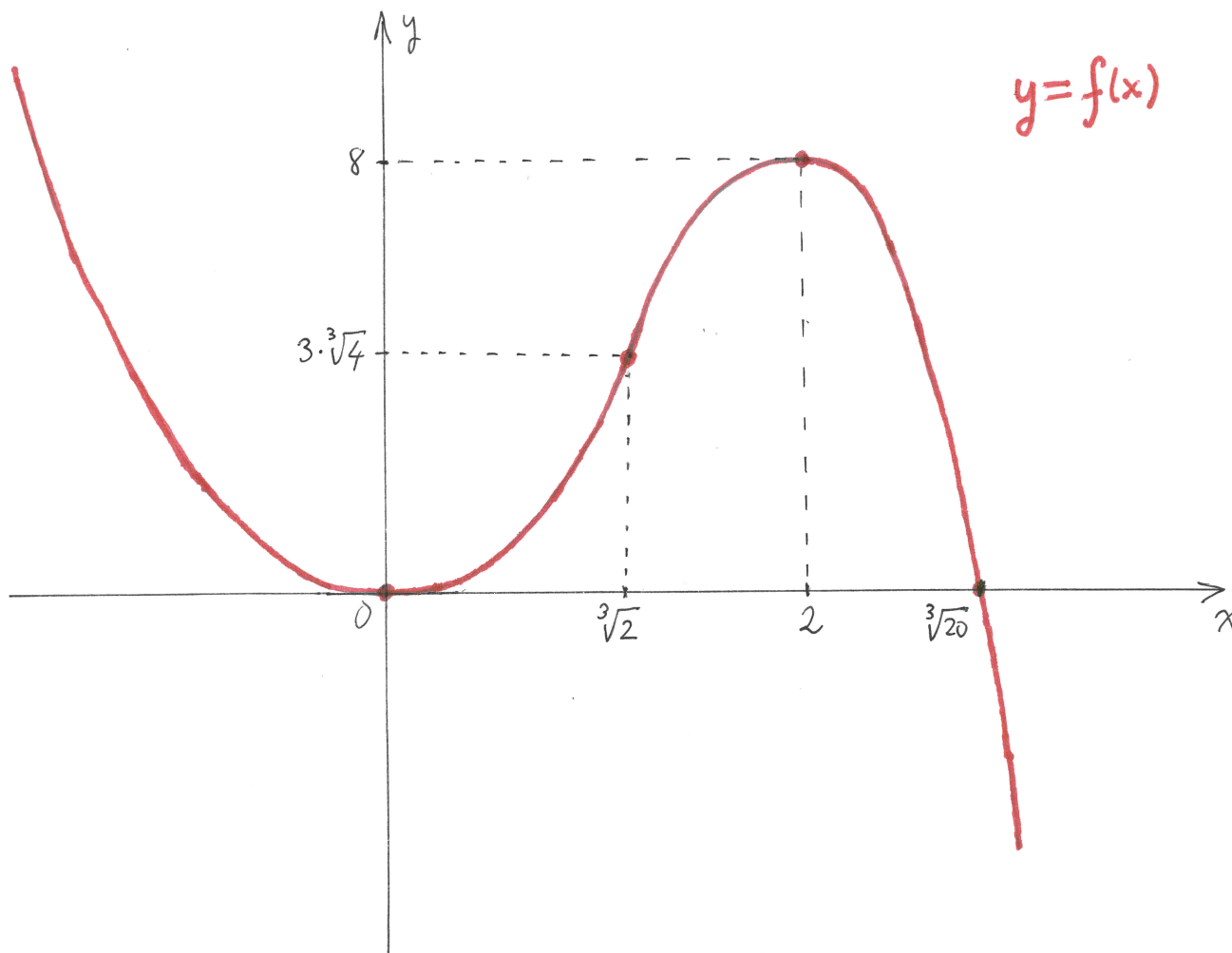


1. A function f that is twice-differentiable on the entire real line satisfies the following conditions:

- ① $f(0) = 0$, $f(\sqrt[3]{2}) = 3\sqrt[3]{4}$, $f(2) = 8$, $f(\sqrt[3]{20}) = 0$
- ② $f'(x) < 0$ for $x < 0$ and for $x > 2$; $f'(x) > 0$ for $0 < x < 2$
- ③ $f''(x) > 0$ for $x < \sqrt[3]{2}$; $f''(x) < 0$ for $x > \sqrt[3]{2}$

a. Sketch the graph of $y = f(x)$ making sure that all important features are clearly shown.



b. Fill in the boxes to make the following a true statement. No explanation is required.

The function $f(x) = ax^b + cx^d$ satisfies the conditions ①-③ if a , b , c and d are chosen as

$$a = \boxed{-\frac{1}{6}}, \quad b = \boxed{5}, \quad c = \boxed{\frac{10}{3}} \quad \text{and} \quad d = \boxed{2}.$$