

## Answer on Question #64499 – Math – Calculus

### Question

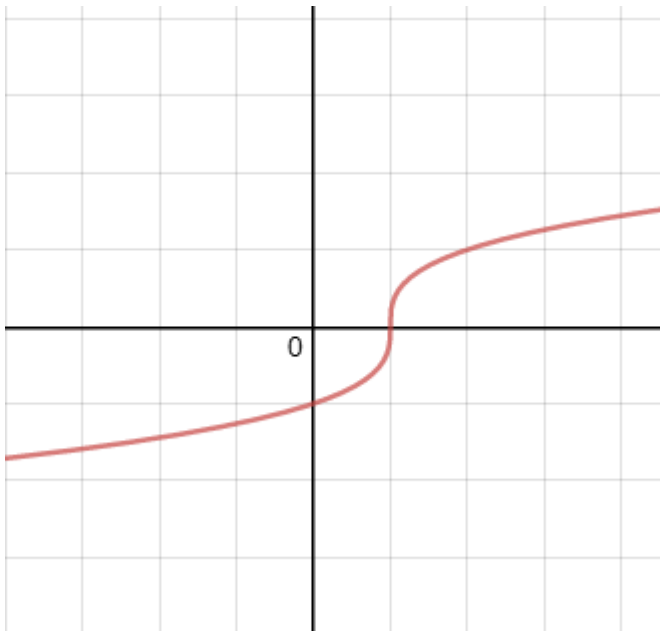
1. Sketch the graph of the following condition:

$$f'(x) > 0, f''(x) > 0, \text{ for } x < h$$

$$f'(x) > 0, f''(x) < 0, \text{ for } x > h$$

### Solution

For example,  $f(x) = \sqrt[3]{x-h}$ .



$$f'(x) = (\sqrt[3]{x-h})' = \frac{1}{3}(x-h)^{-2/3} = \frac{1}{3 \cdot \sqrt[3]{(x-h)^2}} > 0 \text{ for } x < h, x > h,$$

$$f''(x) = \left(\frac{1}{3}(x-h)^{-2/3}\right)' = \frac{1}{3} \cdot \left(-\frac{2}{3}\right)(x-h)^{-5/3} = -\frac{2}{9 \cdot \sqrt[3]{(x-h)^5}} > 0 \text{ for } x < h,$$

$$f''(x) = \left(\frac{1}{3}(x-h)^{-2/3}\right)' = \frac{1}{3} \cdot \left(-\frac{2}{3}\right)(x-h)^{-5/3} = -\frac{2}{9 \cdot \sqrt[3]{(x-h)^5}} < 0 \text{ for } x > h.$$