

Exploring $y=x^3-x$

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$$y = x^3 - x$$

$$y' = 3x^2 - 1$$

$$= (\sqrt{3}x + 1)(\sqrt{3}x - 1)$$

$$= \begin{cases} > 0 & x > \sqrt{1/3} \\ < 0 & -\sqrt{1/3} < x < \sqrt{1/3} \\ > 0 & x < -\sqrt{1/3} \end{cases}$$