3.6 A Summary of Curve Sketching

- Analyze and sketch the graph of a function.

Pre Calculus topics to consider:

1. x and y intercepts(multiplicity)
2. Symmetry
3. Domain
4. Asymptotes/end behavior

Calculus topics to consider:

1. Continuity
2. Differentiability
3. Relative extrema
4. Increasing/Decreasing
5. Concavity
6. Inflection points

#1: Sketch g(x)

$$g(x)=4x^3-3x^4$$

Domain: $(-\infty,\infty)$

Zeros: $0, 4/3$

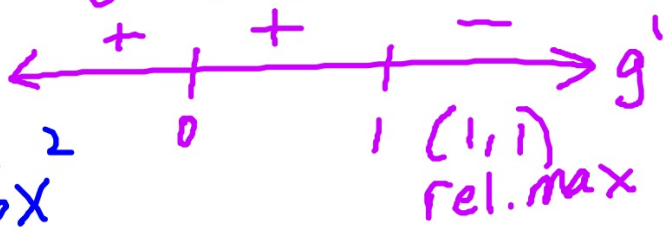
Symmetry: neither

End behavior: ↙ ↘

Relative extrema:

$g'(x)=12x^2-12x^3$

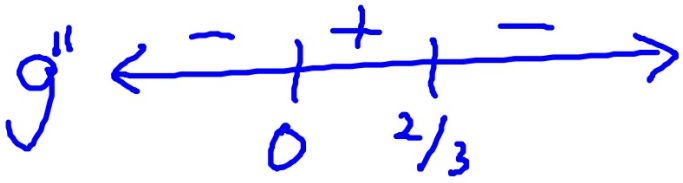
$0=12x^2(1-x)$



POI

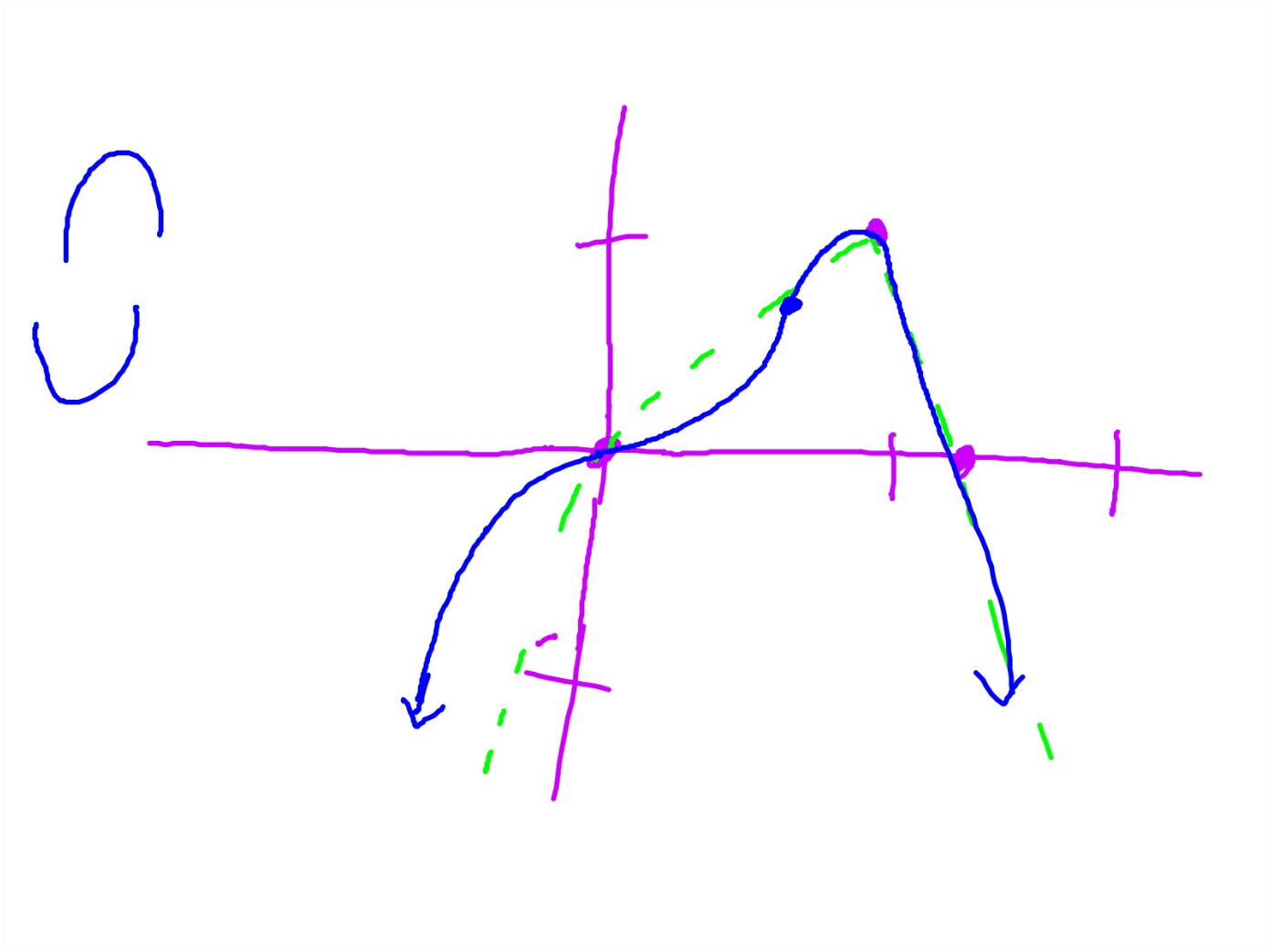
$g''(x)=24x-36x^2$

$0=12x(2-3x)$



POI: $(0,0)$

$\left(\frac{2}{3},\frac{16}{27}\right)$



② $f(x) = \dfrac{2(x^2-9)}{x^2-4}$

Zeros: ± 3

symmetry: Even

Domain: $\{x \mid x \neq \pm 2\}$

Sketch f(x)

$f'(x) = \dfrac{20x}{(x^2-4)^2}$