November 29, 2023

Curve Sketching Review

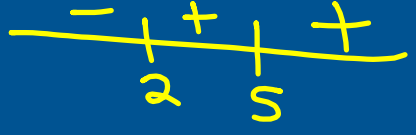
2/ Inc/Dec

1) $f'(x) = 0$ crit pts.

2)

3/ Concave Up/Down

$f''(x) = 0$



Infl pts $(2, -)$

5) Finding Rel Extrema

1st Deriv. Test

1) $f'(x) = 0$

Mountain Test

2nd Deriv Test

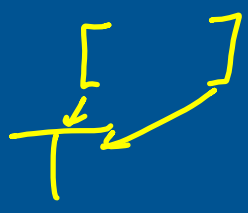
1) Find Crit pts
$f'(x) = 0$

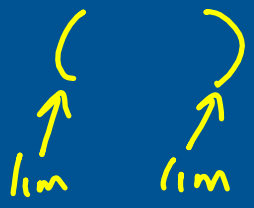
2) Find $f''(x)$

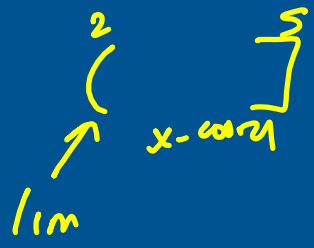
$f''(\text{crit pts}) = +$ ∪ min

$-$ ∩ max

6) Absolute Extrema







$$\lim_{x \to 2} f(x) = 8$$

$$f(x) = 3x^{2/3} - 4x$$

$$f'(x) = 2x^{-1/3} - 4$$

$$0 = \frac{2}{\sqrt[3]{x}} - 4$$

$$\sqrt[3]{x}\ 4 = \frac{2}{\sqrt[3]{x}} \cdot \sqrt[3]{x}$$

$$4\sqrt[3]{x} = 2$$

$$\left(\sqrt[3]{x}\right)^3 = \left(\frac{1}{2}\right)^3$$

$$x = \frac{1}{8} \quad \& \quad x = 0$$

x	
3	-1
5	4

No Abs max

Abs min $(3, -1)$

7/ Asymptotes

Vertical

where denom = 0

$\lim_{x \to 5} f(x) = +\infty$

$\frac{}{x^2+2}$

↓

Horiz

$\lim_{x \to \infty} \frac{4x^3}{8x^3}$

$= \frac{1}{2}$

$\boxed{y = 1/2}$

Numerator has higher power

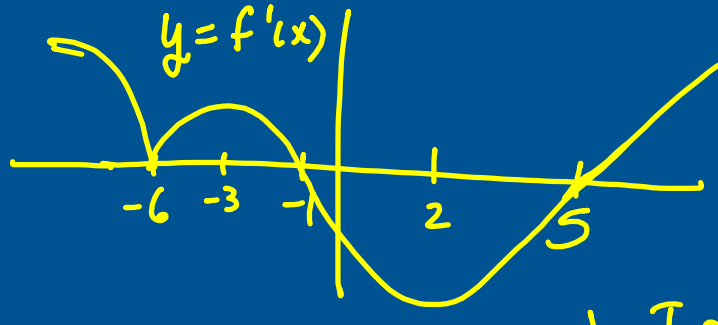
Slant/Curv.

long division

CAS

Solve ($f(x) = 0, x$)

9/



$\therefore$ Crit pts $-6, -1, 5$

Inc | Dec

	+		+		−		+
		-6		-1		5	

above | below x-axis

Rel max/min

Inf(pts $-6, -3, 2$

Concavity (check Inc/Dec)

	−		+		−		+
		-6		-3		2	

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