MA121-003

Monday, October 8

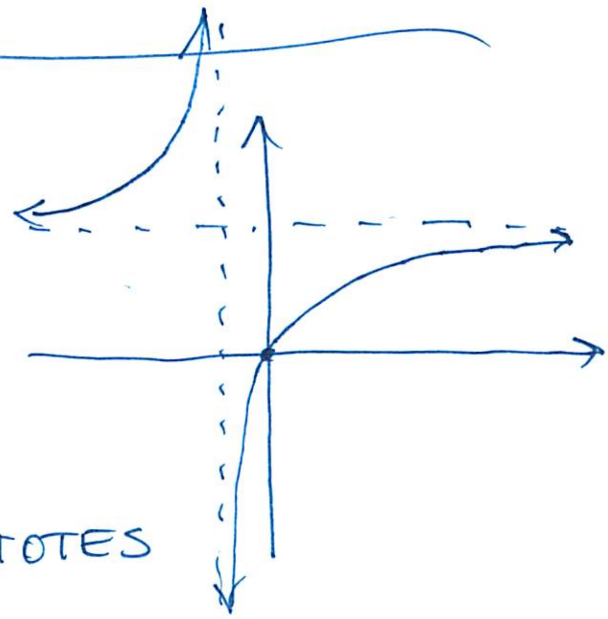
TEST #2 (WED, OCT 10)

1.6; 1.7; 1.8

2.1; 2.2; 2.3; 2.4

(NOT 2.5)

2.3:



1.) VERT ASYMP.

2.) "HOLE" IN A GRAPH

3.) HORIZONTAL ASYMP.

4.) INTERCEPTS

5.) SLANT (OBLIQUE) ASYMPTOTES

6.) $f'(x)$ INFO (2.1)

7.) $f''(x)$ INFO (2.2)

ex: $f(x) = \dfrac{6x}{8x+3}$

V.A.: $x = -3/8$

H.A.: $y = 3/4$ $\quad \lim_{x\to\infty} \dfrac{6x}{8x+3} = \dfrac{6}{8} = \dfrac{3}{4}$

INT: $(0,0)$

$(0,0)$

① $\cancel{f'(x)=0}$

② $f'(x)$ undef at $x = -3/8$

$$f'(x) = \frac{(8x+3)(6) - (6x)(8)}{(8x+3)^2} = \frac{\cancel{48x}+18-\cancel{48x}}{(8x+3)^2}$$

$$\boxed{f'(x) = \frac{18}{(8x+3)^2}} = +$$

$$f(x) = \frac{x^2+x-2}{2x^2-2} = \frac{(x+2)(x-1)}{2(x^2-1)}$$

$$= \frac{(x+2)\boxed{\cancel{(x-1)}}}{2(x+1)\boxed{\cancel{(x-1)}}}$$

hole in graph at $\underline{x=1}$ $(1, \frac{3}{4})$

$$f(x) = \frac{x+2}{2(x+1)} = \frac{x+2}{2x+2}$$

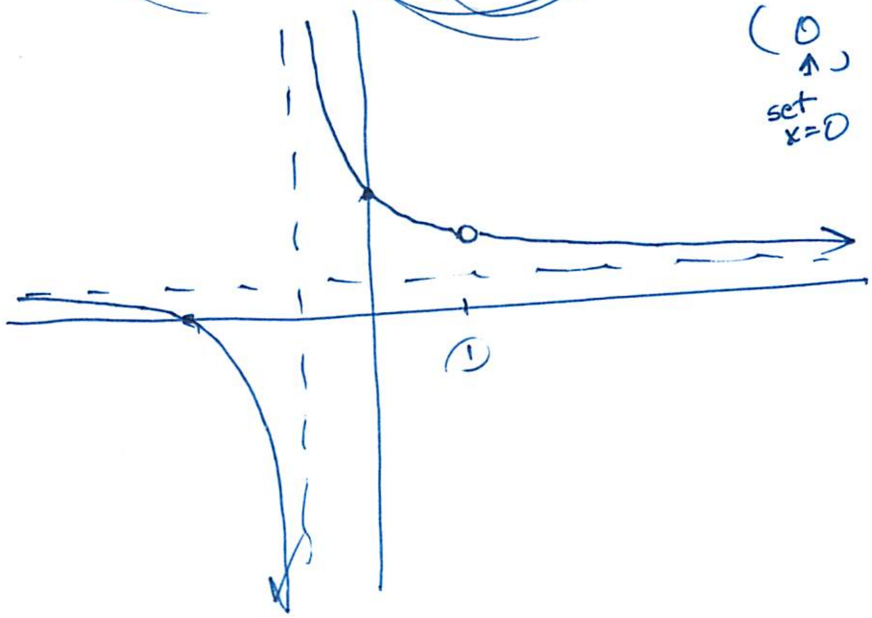
V.A.: $x=-1$

H.A.: $y=\frac{1}{2}$

$(0, 1)$ ← set $x=0$

$(-2, 0)$ ← set $y=0$

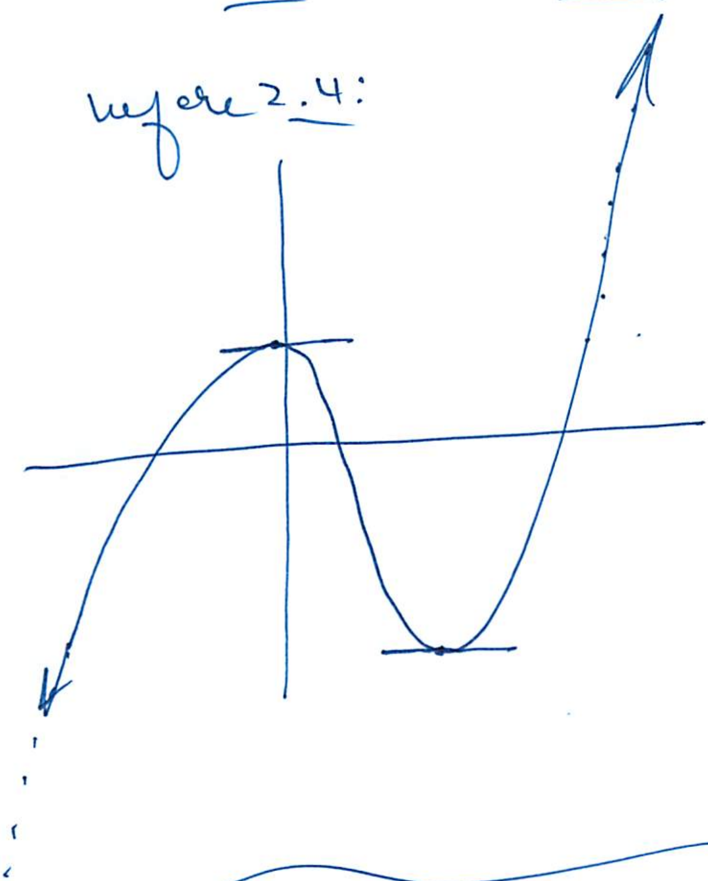
$f'(x) =$



2.4: ABSOL. MAX/MIN

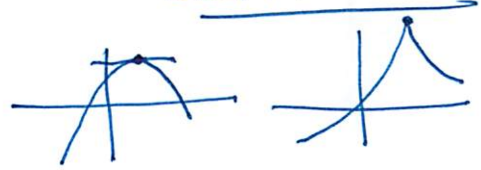
ON A CLOSED INTERVAL

before 2.4:



not an ABSOL. MAX/MIN

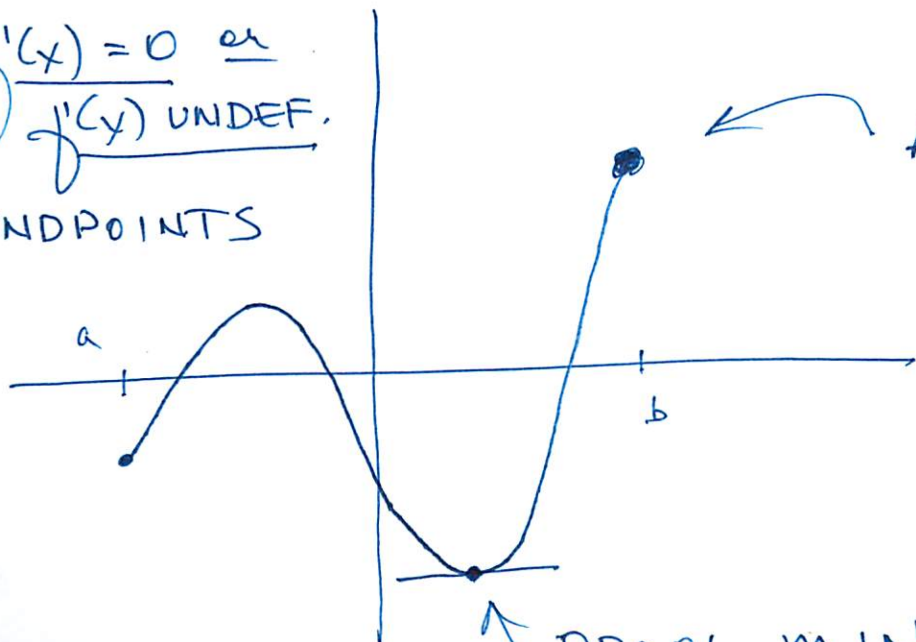
CRIT. PTS:



on a CLOSED INTERVAL
[a, b]

① $f'(x) = 0$ or
$f'(x)$ UNDEF.

② ENDPOINTS



ABSOL. MAX

ABSOL. MIN

find the absol. max value of the function

(largest y-value plotted)

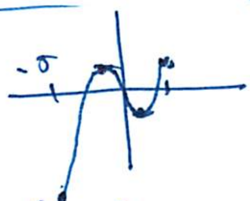
ex: $f(x) = x^3 - 3x$ on $[-5, 2]$

1. endpoints:

$(-5, ?)$ and $(2, ?) \to (2, 2)$ ✓

$(-5, -110) \leftarrow (-5, ?)$, $\uparrow f(-5)$

$\uparrow f(2)$



$f(-5) = (-5)^3 - 3(-5)$

$f(-5) = -125 + 15 = -110$

$f(2) = 2^3 - 3(2) = 8 - 6 = 2$

2. critical points:

$f'(x) = 3x^2 - 3 = 3(x^2 - 1) = 3(x-1)(x+1)$

$f'(x) = 0$ at $x = 1$ & $x = -1$

$(1, -2) = (1, \uparrow)$ & $(-1, \uparrow) = (-1, 2)$ ✓

$f(1) = 1^3 - 3(1)$

$f(1) = 1 - 3 = -2$

$f(-1) = (-1)^3 - 3(-1) = -1 + 3 = 2$

ABS MIN: -110

ABS MAX: 2