

#191

$$y = 2x^2 - 8x + 9$$

$$y' = 4x - 8$$

$$f(2) = 2(2)^2 - 8(2) + 9$$

$$f(2) = 1$$

$$4x - 8 = 0$$

crit  
#:  $x = 2$

Abs min of  $f$  @  $x = 2$

$$\#20: y = x^3 - 2x + 4$$

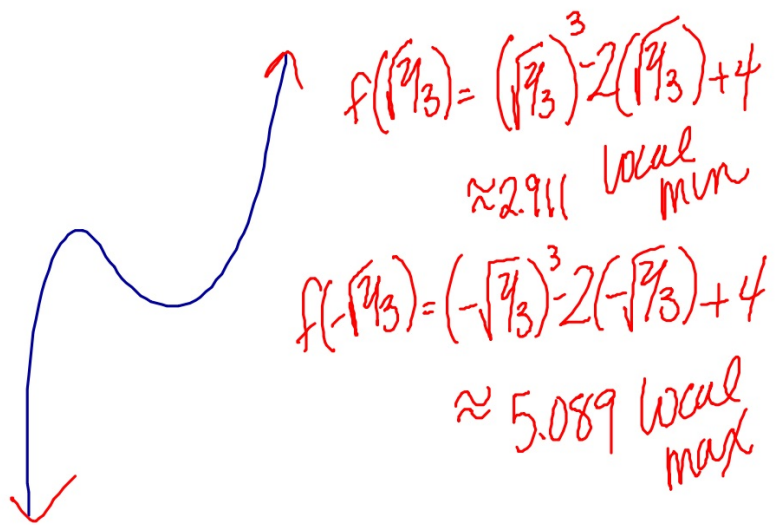
$$y' = 3x^2 - 2$$

$$3x^2 - 2 = 0$$

$$3x^2 = 2$$

$$x^2 = \frac{2}{3}$$

$$x = \pm \sqrt{\frac{2}{3}}$$



$$\#25] \quad y = \frac{1}{\sqrt{1-x^2}} = (1-x^2)^{-\frac{1}{2}}$$

$$f(0) = \frac{1}{\sqrt{1-0^2}} = 1$$

$$y' = -\frac{1}{2}(1-x^2)^{-\frac{3}{2}}(-2x)$$

$$= \frac{x}{(1-x^2)^{\frac{3}{2}}}$$

$$\boxed{x=0} \quad x \neq \pm 1$$

Abs min of 1 @  $x=0$ .

#211  $y = x^3 + x^2 - 8x + 5$



Crit #s

$$y' = 3x^2 + 2x - 8$$

$$3x^2 + 2x - 8 = 0$$
$$(3x - 4)(x + 2)$$

$$x = \frac{4}{3} \quad x = -2$$

$$f(-2) = (-2)^3 + (-2)^2 - 8(-2) + 5 = 17$$

local max

$$f\left(\frac{4}{3}\right) = \left(\frac{4}{3}\right)^3 + \left(\frac{4}{3}\right)^2 - 8\left(\frac{4}{3}\right) + 5 = -\frac{41}{27}$$

local min

$$y = x^3 - 3x^2 + 3x - 2$$

$$y' = 3x^2 - 6x + 3$$

$$3x^2 - 6x + 3 = 0$$

$$3(x^2 - 2x + 1) = 0$$

$$3(x-1)(x-1) = 0$$

$$x = 1$$



#24]  $y = \frac{1}{x^2-1} = (x^2-1)^{-1}$

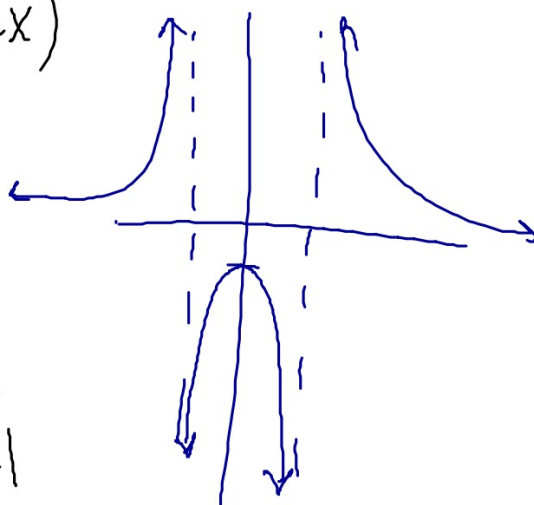
$$f(0) = \frac{1}{0^2-1} = -1$$

$$y' = -(x^2-1)^{-2} (2x)$$

$$y' = \frac{-2x}{(x^2-1)^2}$$

Zero  
 $x=0$

und  
 ~~$x \neq \pm 1$~~



local max of  $-1$   
@  $x=0$ .

$$y = \sqrt{x^2 - 1} = (x^2 - 1)^{1/2}$$

$$y' = \frac{1}{2}(x^2 - 1)^{-1/2} (2x)$$

$$y' = \frac{x}{\sqrt{x^2 - 1}}$$

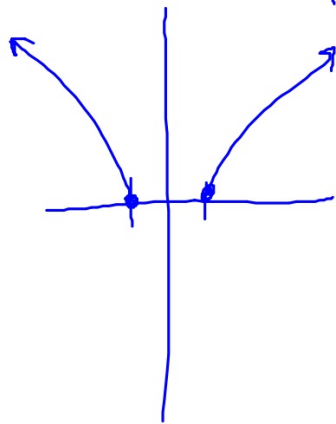
$$\cancel{x \neq 0}$$

$$x = 1$$

$$x = -1$$

$$f(-1) = \sqrt{(-1)^2 - 1} = 0$$

$$f(1) = \sqrt{1^2 - 1} = 0$$



Abs. min of  $y$  @  $x = \pm 1$

#25

$$y = \frac{1}{\sqrt{1-x^2}} = (1-x^2)^{-\frac{1}{2}}$$

$$y' = -\frac{1}{2}(1-x^2)^{-\frac{3}{2}}(-2x)$$

$$y' = \frac{x}{(1-x^2)^{\frac{3}{2}}}$$

zero

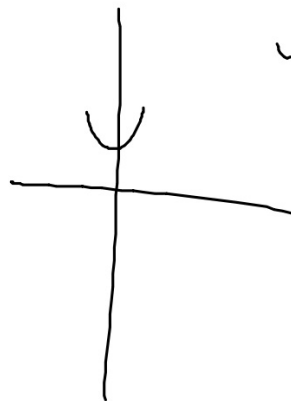
$$x=0$$

und

$$x = \pm 1$$

$$f(0) = \frac{1}{\sqrt{1-0^2}} = 1$$

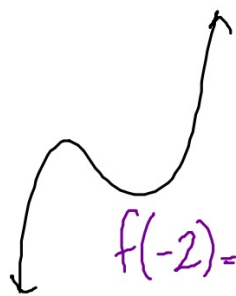
Abs min of 1 @  $x=0$ .





#21)

$$y = x^3 + x^2 - 8x + 5$$



$$f(-2) = 17 \text{ local max}$$

$$f\left(\frac{4}{3}\right) = -\frac{41}{27} \text{ local min}$$

$$y' = 3x^2 + 2x - 8$$

$$3x^2 + 2x - 8 = 0$$

$$(3x-4)(x+2) \quad x = \frac{4}{3} \\ x = -2$$

$$x^2 + 2x - 24$$

$$\left(x + \frac{6}{3}\right)\left(x - \frac{4}{3}\right)$$

$$(x+2)(3x-4)$$