

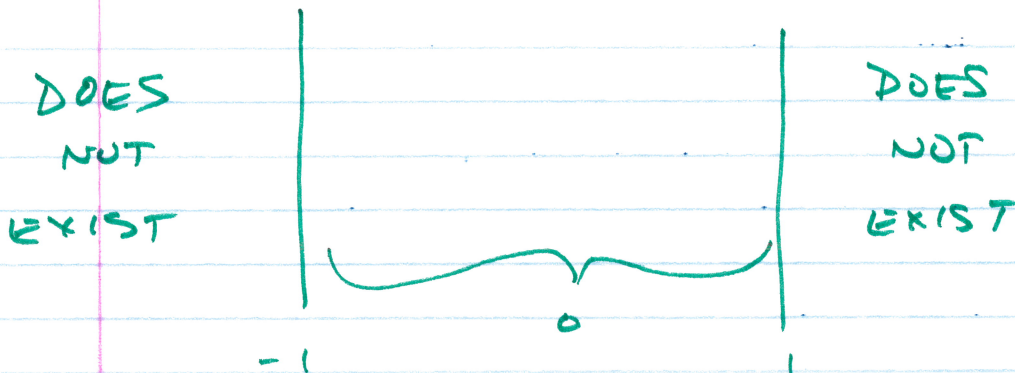
$\frac{a}{b}$ ← POWER
 b ← ROOT
 x

4.1
 (25) $y = \sqrt{1-x^2} = (1-x^2)^{-\frac{1}{2}}$

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

$$= \frac{x}{\sqrt{(1-x^2)^3}} \rightarrow \boxed{x=0}$$

$$\rightarrow x \neq 1 \quad x \neq -1$$



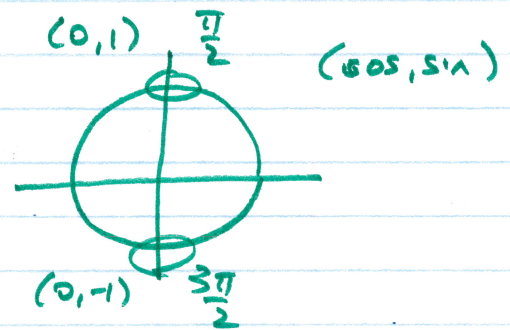
(15) $f(x) = \sin(x + \frac{\pi}{4}) \quad 0 \leq x \leq \frac{\pi}{4}$
 $f'(x) = \cos(x + \frac{\pi}{4}) = 0$

$$x + \frac{\pi}{4} = \frac{\pi}{2}$$

$$x = \frac{\pi}{4}$$

$$x + \frac{\pi}{4} = \frac{3\pi}{2}$$

$$x = \frac{5\pi}{4}$$



$$f(0) = \frac{\sqrt{2}}{2} \quad \text{LOCAL MAX MIN}$$

$$f\left(\frac{\pi}{4}\right) = 1 \quad \text{GLOBAL MAX, LOCAL MAX}$$

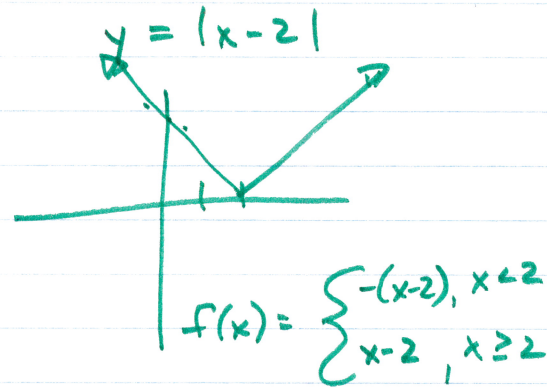
$$f\left(\frac{3\pi}{4}\right) = -1 \quad \text{GLOBAL MIN, LOCAL MIN}$$

$$f\left(\frac{\pi}{2}\right) = 0 \quad \text{LOCAL MIN MAX}$$

4.1

③ $f(x) = |x-2| + |x+3|$

$$f(x) = \begin{cases} -2x - 1, & x < -3 \\ 5, & -3 \leq x \leq 2 \\ 2x + 1, & x > 2 \end{cases}$$



$x < -3$

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

$-x + 2 - x - 3$

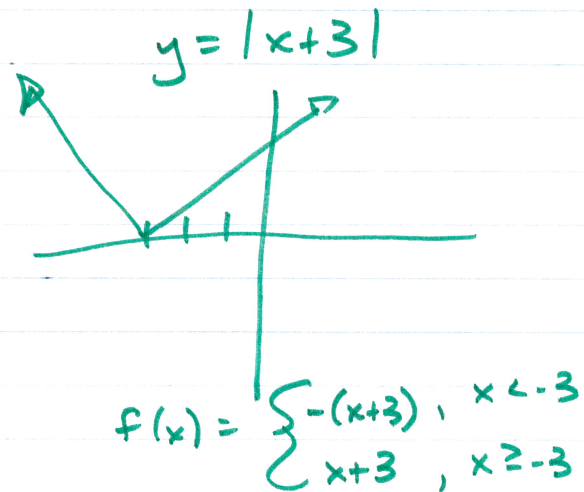
$-3 \leq x \leq 2$

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

$-x + 2 + x + 3$

$x > 2$

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



$$f'(x) = \begin{cases} -2, & x < -3 \\ 0, & -3 \leq x \leq 2 \\ 2, & x > 2 \end{cases}$$

$f(-5) = 9$ LOCAL MAX

$f(-3) = 5$ GLOBAL MIN, LOCAL MIN

$f(5) = 11$ GLOBAL MAX, LOCAL MAX

4.1

(37)

$$y = x \sqrt{4-x^2}$$

$$y = x(4-x^2)^{1/2}$$

$$y' = (4-x^2)^{1/2} + \frac{1}{2}(4-x^2)^{-1/2} [-2x] x = 0$$

$$= (4-x^2)^{-1/2} [(4-x^2) - x^2] = 0$$

$$= \frac{4-2x^2}{\sqrt{4-x^2}} = 0$$

$$4-2x^2 = 0$$

$$4 = 2x^2$$

$$2 = x^2$$

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

$$\sqrt{4-x^2} = 0$$

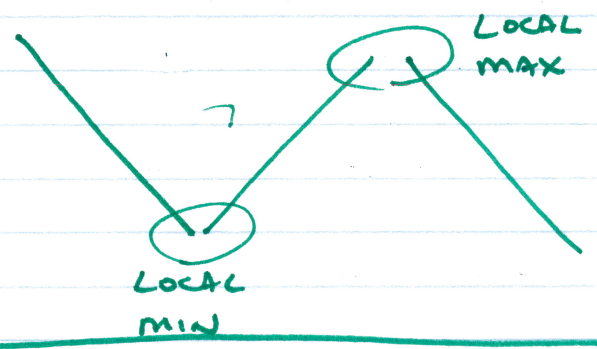
$$4-x^2 = 0$$

$$4 = x^2$$

$$\pm 2 = x$$

FDT

	DECR.	INCR.	DECR.	
ERROR	-.378	2	-.378	
-3	-1.5	0	1.5	3
-2	$-\sqrt{2}$	$\sqrt{2}$	2	



$$y(-2) = 0$$

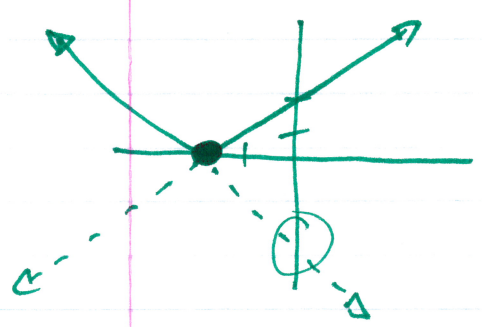
$$y(-\sqrt{2}) = -2$$

$$y(\sqrt{2}) = 2$$

$$y(2) = 0$$

$$y = |x+2|$$

$$y = \begin{cases} -x-2 & x \leq -2 \\ x+2 & x > -2 \end{cases}$$



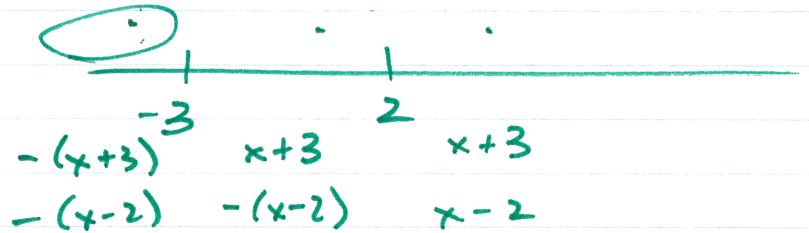
$$|-(x+2)| = x+2$$

4.1

31) $y = |x-2| + |x+3|$

$\rightarrow - (x-2) \quad x \leq 2$
 $x-2 \quad x > 2$

$\rightarrow - (x+3) \quad x \leq -3$
 $x+3 \quad x > -3$

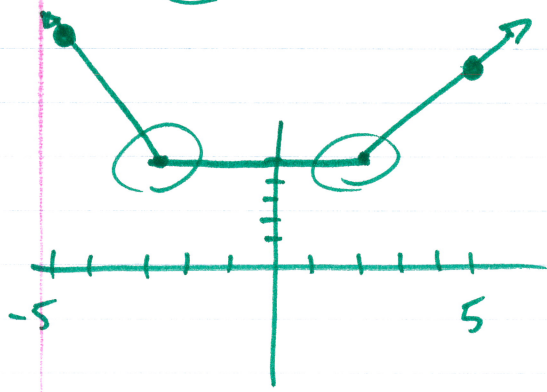


$$y = \begin{cases} -2x-1 & x < -3 \\ 5 & -3 \leq x \leq 2 \\ 2x+1 & x > 2 \end{cases}$$

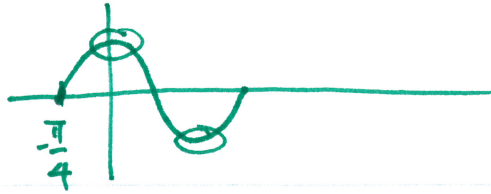
$$\begin{aligned} & |x-2| + |x+3| \\ & - (x-2) + - (x+3) \\ & \underline{-x+2} \quad \underline{-x-3} \end{aligned}$$

$$y' = \begin{cases} -2 & x < -3 \\ 0 & -3 < x < 2 \\ 2 & x > 2 \end{cases}$$

$$\begin{aligned} & |x-2| + |x+3| \\ & - (x-2) + (x+3) \\ & \cancel{-x} + 2 + \cancel{x} + 3 \\ & \underline{(x-2) + (x+3)} \end{aligned}$$

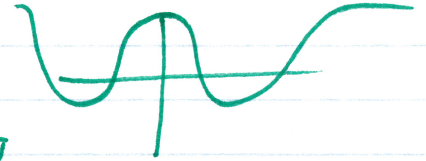


$y(-5) = 9$
 $y(-3-2) = 5$
 $y(5) = 11$



4.1
 (15) $f(x) = \sin(x + \frac{\pi}{4})$
 $f'(x) = \cos(x + \frac{\pi}{4}) [] = 0$

$0 \leq x \leq \frac{7\pi}{4}$



$\cos(\frac{\pi}{2}) = 0$
 $\cos(\frac{3\pi}{2}) = 0$

$x + \frac{\pi}{4} = \frac{\pi}{2}$
 $x = \frac{\pi}{4}$

$x + \frac{\pi}{4} = \frac{3\pi}{2}$
 $x = \frac{5\pi}{4}$

