

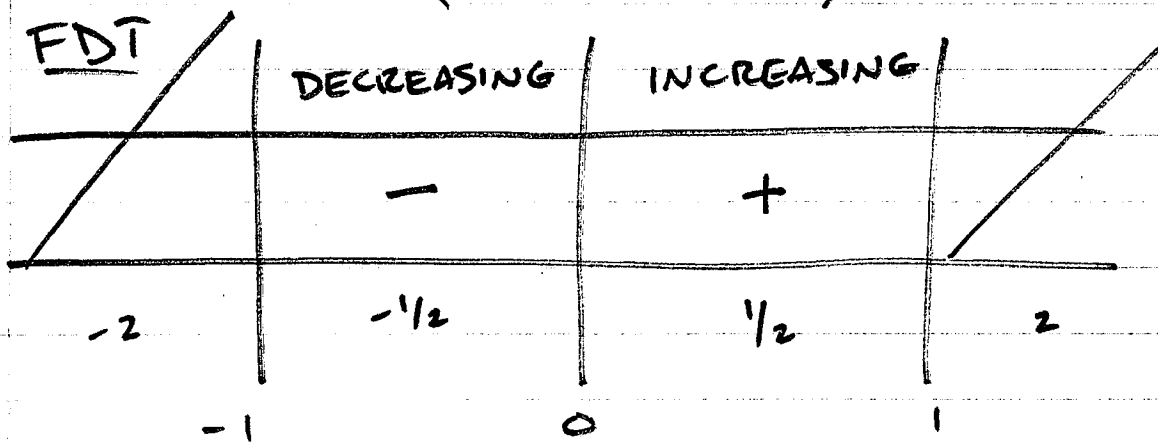
25) A.1

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

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

$$= \frac{x}{\sqrt{(1-x^2)^3}} = 0 \quad x=0 \quad x \neq \pm 1$$

power
↓
-3/2 ← root



$$y(-1) = \infty$$

$$y(0) = 1 \text{ min}$$

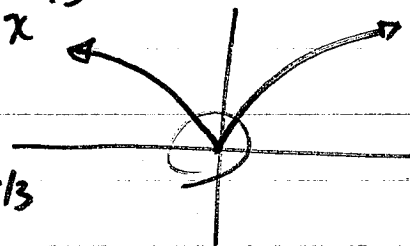
$$y(1) = \infty$$

$$\frac{1}{\sqrt{1-(-1)^2}} = \frac{1}{\sqrt{0}} = \frac{1}{0} = \frac{1}{0} \cdot \frac{2}{3}$$

$$y = x^{2/3}$$

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

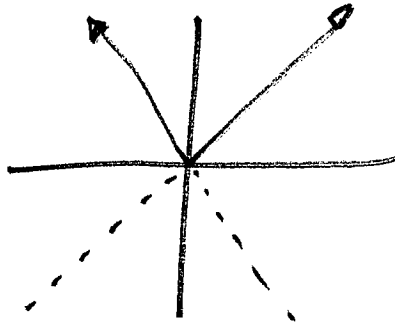
$$= \frac{2}{3\sqrt[3]{x}} \quad x \neq 0$$



4.1

$$y = |x|$$

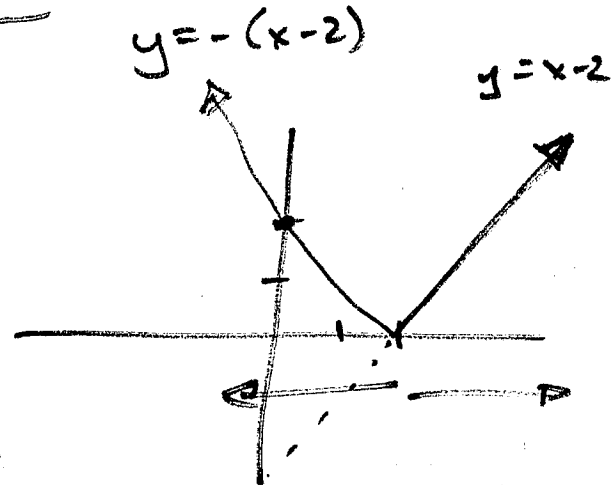
$$y = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$$



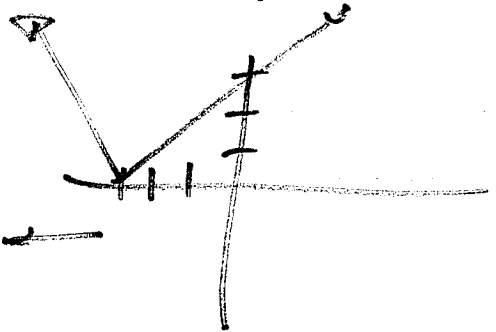
$$-(x-2), x < 2 \quad (x-2), x > 2$$

3i) $f(x) = |x-2| + |x+3|$

$$\begin{cases} -(x+3), & x < -3 \\ x+3, & x > -3 \end{cases}$$



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



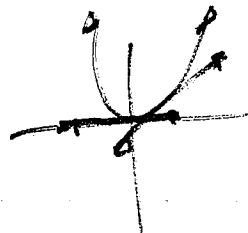
$$\begin{aligned} x < -3 \\ -(x+3) + -(x-2) \\ -x-3-x+2 \\ -2x-1 \end{aligned}$$

$$\begin{aligned} x+3 + -(x-2) \\ x+3-x+2 \\ 5 \end{aligned}$$

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

$$f'(x) = \begin{cases} -2 \\ 0 \\ 2 \end{cases}$$

$$2x+1$$

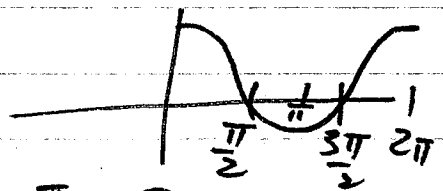


4.1 x^{-1}
 11) $f(x) = \frac{1}{x} + \ln x$ $[.5, 4]$
 $f'(x) = -x^{-2} + \frac{1}{x}$
 $= -\frac{1}{x^2} + \frac{1}{x} = 0$
 $\frac{1}{x} = \frac{1}{x^2}$
 $x = 1$

$f(.5) = 2 + \ln .5 \rightarrow 1.307$
 $f(1) = 1 + \ln 1 \rightarrow 1$ ^{ABS MIN}
 $f(4) = \frac{1}{4} + \ln 4 \rightarrow 1.636$ ^{ABS MAX}

LOCAL MAX ~~$(.5, 1.307)$~~ ^{ABS MAX} $x = 4$ $y = 1.636$
 LOCAL MAX $x = 4$ $(4, 1.636)$
 ABS MIN $x = 1$ $y = 1$
 REL MIN $x = 1$ $y = 1$ $(1, 1)$

15) $f(x) = \sin(x + \frac{\pi}{4})$ $[0, \frac{7\pi}{4}]$
 $f'(x) = \cos(x + \frac{\pi}{4}) = 0$
 $x = \frac{\pi}{4}, \frac{5\pi}{4}$



$6\pi - \frac{2\pi}{2} - \frac{\pi}{4} = \frac{5\pi}{4}$
 4

$f(0) = .707$
 $f(\frac{\pi}{4}) = 1$ ^{ABS MAX}
 $f(\frac{5\pi}{4}) = -1$ ^{ABS MIN}
 $f(\frac{7\pi}{4}) = 0$

ABS MAX OF 1 AT $x = \frac{\pi}{4}$
 LOCAL MAX @ ~~$(\frac{\pi}{4}, 1)$~~
 ABS MIN OF -1 AT $x = \frac{5\pi}{4}$
 LOCAL MIN @ ~~$(\frac{5\pi}{4}, -1)$~~
 LOCAL MAX @ $(\frac{7\pi}{4}, 0)$

LOCAL MIN $(0, .707)$

19) $y = 2x^2 - 8x + 9$
 $y' = 4x - 8 = 0$
 $x = 2$

35) $y = x^{2/3}(x+2)$
 $y' = \frac{2}{3}x^{-1/3}(x+2) + x^{2/3} \cdot 1$
 $= \frac{2}{3}x^{-1/3}x + \frac{4}{3}x^{-1/3} + x^{2/3}$
 $= \frac{2}{3}x^{2/3} + \frac{4}{3}x^{-1/3} + x^{2/3}$
 $= \frac{5}{3}x^{2/3} + \frac{4}{3}x^{-1/3} = 0$
 $\frac{5}{3}x^{2/3} = -\frac{4}{3}x^{-1/3}$
 $x^{2/3} = -\frac{4}{5}x^{-1/3}$
 $x^{2/3} \cdot x^{1/3} = -\frac{4}{5}x^{-1/3} \cdot x^{1/3}$
 $x = -\frac{4}{5}$
 $x \neq 0$