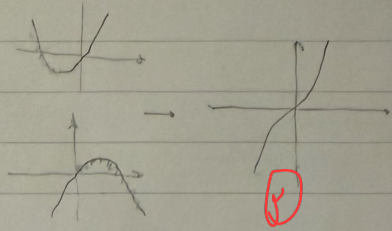
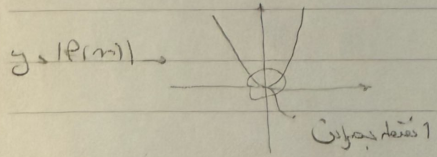


$f(x) = a f(x) + b$ $x > 0$ $f(x) = a^x + b$
 $x < 0$ $f(x) = -a^x + b$



۶



$[0, a]$ $0 \leq x < a - a \leq x - a \leq 0 \rightarrow |x - a| = a - x$

۷

$f(x) = \sqrt[x]{a - x} = a - x \cdot \frac{1}{x^2}$

$f'(x) = \frac{1}{x} \ln a \cdot x^{-\frac{1}{x}} - \frac{1}{x^2} (a - x) \cdot x^{-\frac{1}{x} - 1}$ $\frac{1}{x^2} (a - x) \cdot x^{-\frac{1}{x} - 1}$ so $\frac{1}{x^2} (a - x) \cdot x^{-\frac{1}{x} - 1}$

$f(0) = f(a) = 0$

$f(\frac{1}{2}a) > 0$ $\sqrt[\frac{1}{2}]{a - \frac{1}{2}a} = \sqrt[\frac{1}{2}]{\frac{1}{2}a} = \frac{1}{\sqrt{2}} \sqrt{\frac{1}{2}a} = \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{2}} \sqrt{a} = \frac{1}{2} \sqrt{a}$

$a > 0$ $\frac{0}{\frac{1}{2}a} > \frac{0}{\frac{1}{2}a}$ $a > \frac{1}{2}a$

۸

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

$x > 0$

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

۹

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

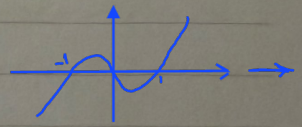
$y = |x| - x \rightarrow \begin{cases} x - x & x \geq 0 \\ -x - x & x < 0 \end{cases}$

۱۰

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

$x < 0$

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

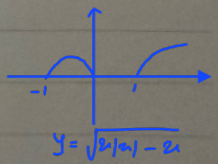


$0 \leq x \leq 1$ $\frac{1 - x}{\sqrt{2x - x^2}}$ $x = 1$ $x = 0$

میگن با هم مقایسه

قوانین

(بیشترین) $K = f$ (max) $M = 1$ (min) $N = 0$



$\frac{K + N}{K - N} = \frac{f + 0}{f - 0} = \frac{f}{f} = 1$

$$y' = \frac{m(m-1+m) - (m\lambda^m)(1)}{(m-1+m)^m} = \frac{m^m - m - m}{(m-1+m)^m} < 0$$

+ abo

$$\frac{(m-1)(m+1) - 1 - \mu}{m^2 - 1} \quad \checkmark$$

صحيح 2 5 10 5 صحيح

$$f(m) = \frac{\lambda}{1-\lambda^m} \quad f'(m) = \frac{\lambda(1-\lambda^m) - \lambda(-\lambda^m)}{(1-\lambda^m)^2} = \frac{1-\lambda^m + \lambda^m}{(1-\lambda^m)^2} > 0$$

$$f(m) = \frac{\lambda}{1+\lambda^m} \quad f'(m) = \frac{\lambda(1+\lambda^m) - \lambda(\lambda^m)}{(1+\lambda^m)^2} = \frac{1-\lambda^m}{(1+\lambda^m)^2} > 0$$

صحيح 2 5 10 5 صحيح

$$f(0^+) = f(0^-) = 0$$

$$f'_+(0) \leq f'_-(0) \leq 1$$

صحيح 2 5 10 5 صحيح

$$D_{f(x)} = 1 - a^x = 0 \rightarrow a^x = 1 \rightarrow \begin{cases} a^x = 1 \rightarrow x = 0 \checkmark \\ -a^x = 1 \rightarrow a^x = -1 \times \end{cases} \rightarrow D_f = \mathbb{R} - \{0\}$$

$$\begin{cases} a^x \rightarrow f(x) = \frac{1-a^x + \lambda a^x}{(1-a^x)^2} = \frac{a^x + 1}{(1-a^x)^2} \rightarrow a^x = -1 \times \\ a^x \rightarrow f(x) = \frac{1+a^x - \lambda a^x}{(1+a^x)^2} = \frac{1-a^x}{(1+a^x)^2} \rightarrow a^x = 1 \rightarrow x = -1 \checkmark \end{cases}$$

في نقطة معينة