

(الف)

$$(2, 2), (3, 2), (4, 2) \Rightarrow \boxed{m=3}$$

$$\Rightarrow n - n = 2$$

$$n - n = 0 \quad \text{غیر}$$

$$\Rightarrow \boxed{n=2}$$

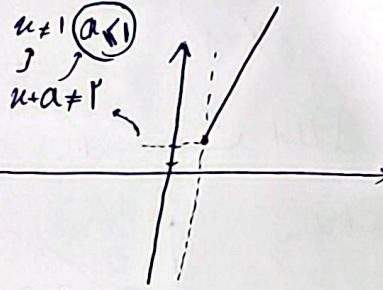
(۱)

ب) $(m, 3), (2, 2) \Rightarrow \boxed{m=2}$

$$\Rightarrow (a, n), (1, 2) \Rightarrow \boxed{n=2}$$

$$(a, \frac{1}{n-2}) (-1, 1) \Rightarrow \boxed{a=-1}$$

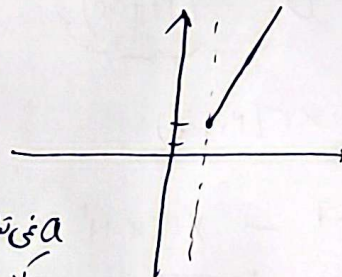
$$f(x) = \begin{cases} 3x-1 & ; x > 1 \\ x+a & ; x < 1 \end{cases}$$



(۲)

$$\left. \begin{array}{l} x+a < 2 \\ x < 1 \\ x+1 < 2 \end{array} \right\} \Rightarrow \boxed{a < 1}$$

$$f(x) = \begin{cases} 3x-1 & ; x > 1 \\ ax+a-1 & ; x < 0 \end{cases}$$



(۳)

$$\Rightarrow ax+a-1 < 2$$

$$ax+a < 3$$

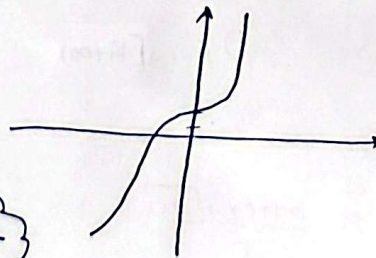
$$\xrightarrow{x=0} a < 3 \quad I$$

a نمی تواند حتی باشد زیرا تابع را غیر یک به یک

$$\cap a < 0 \Leftarrow \text{یک به یک}$$

$$\Rightarrow \cap I = \boxed{0 < a < 3}$$

(الف) $y = x^3 + 2$



همچین خطی که دارای محور ها است نمودار دارد

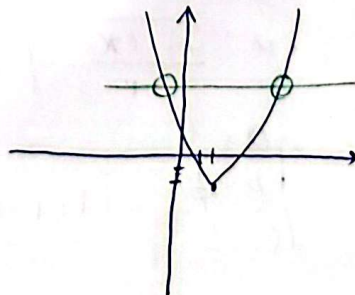
تقطعه قطع نمی کند یک به یک است!

(۴)

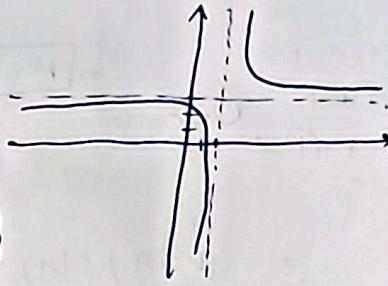
$$\rightarrow x = y^3 + 2$$

$$x-2 = y^3 \rightarrow \boxed{y = \sqrt[3]{x-2}}$$

ب) $y = x^2 - 4x + 2$ دایره ای یک به یک نیست زیرا آفرینی شود



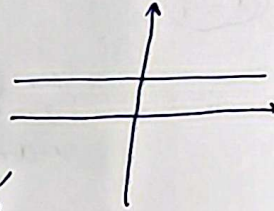
الف) $y = \frac{3x+1}{x-2} \Rightarrow$ تابع هذکرانگی یک به یک اند



⑤

پایین $\rightarrow x = \frac{2y+1}{y-3} \Rightarrow y = \frac{2x+1}{x-3}$

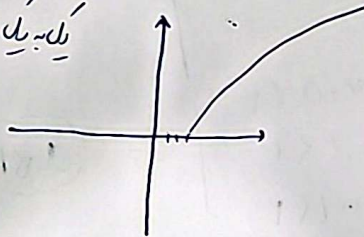
ب) $y = \frac{4+2x}{x+2} \xrightarrow{\text{مشتق}} ② \Rightarrow y = 2$



یک به یک نیست اصلاً!

الف) $y = \sqrt{x-3}$

یک به یک است.



⑥

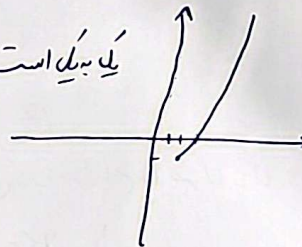
$\rightarrow x = \sqrt{y+3}$

$x^2 = y+3 \Rightarrow y = x^2+3$

$D_{f(x)} = [2, +\infty)$

ب) $y = x^2 - 4x + 3, x \in [2, +\infty)$

یک به یک است!



$\rightarrow y = x^2 - 4x + 4 - 1 \rightarrow y = (x-2)^2 - 1$

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

$\Rightarrow x = \sqrt{y+1} + 2 \Rightarrow y = \sqrt{x+2} + 2$

$D_{f(x)} = [-1, +\infty)$

نویس

$\sqrt{x} = t$

$y = t^2 + t \Rightarrow t^2 + t - y = 0$

نویس - زیراداسه ای است!

$t = \frac{-1 \pm \sqrt{1+4y}}{2} \Rightarrow \sqrt{x} = \frac{-1 \pm \sqrt{1+4y}}{2} \Rightarrow x = \frac{1+4y \pm 2\sqrt{1+4y}}{4}$

$\Rightarrow y = \frac{2+4y-2\sqrt{1+4y}}{4} \Rightarrow \frac{1}{2} + x - \frac{\sqrt{1+4x}}{2} = \frac{1}{2} + x - \sqrt{x+\frac{1}{4}}$

$\Rightarrow ax+b-\sqrt{x-c} \Rightarrow \begin{cases} a=1 \\ b=\frac{1}{2} \\ c=-\frac{1}{4} \end{cases} \Rightarrow 1+1-1=①$

⑦

$$y = \frac{x}{\sqrt{x^2 - 2}} \longrightarrow \begin{matrix} * \\ \text{در } y \text{ همواره } x \\ \text{علاقت مستقیم} \end{matrix} \xrightarrow{\text{ریشه اصلی}} \begin{cases} (x_1, y) \\ (x_2, y) \end{cases} =, x_1 = x_2 \quad (1)$$

$$\Rightarrow \frac{x_1}{\sqrt{x_1^2 - 2}} = \frac{x_2}{\sqrt{x_2^2 - 2}} \xrightarrow{\text{تقاطع}} \frac{x_1^2}{x_1^2 - 2} = \frac{x_2^2}{x_2^2 - 2} \Rightarrow x_1^2 x_2^2 - 2x_2^2 = x_2^2 x_1^2 - 2x_1^2$$

$$x_1^2 = x_2^2$$

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

$$\Rightarrow x_1 = x_2$$

$$\xrightarrow{*} \text{مشتق اول}$$

$$\Rightarrow y = \pm \frac{x\sqrt{2}}{\sqrt{x^2 - 1}} \xrightarrow{*} y = \frac{x\sqrt{2}}{\sqrt{x^2 - 1}}$$

* خطی بدون خود

$$f(x) \Rightarrow x = \frac{y}{1+|y|} = -\frac{2}{5} \Rightarrow -5y = 2 + 2|y| \xrightarrow{y < 0} -5y = 2 - 2y$$

$$-3y = 2$$

$$y = -\frac{2}{3}$$

$$\rightarrow x = \sqrt{y - 1}$$

$$x + 1 = \sqrt{y}$$

$$y = x^2 + 2x + 1 \longrightarrow g\left(-\frac{2}{5}\right) = \frac{4}{25} - \frac{4}{5} + 1 = \frac{9}{25}$$

$$\Rightarrow f\left(-\frac{2}{5}\right) + g\left(-\frac{2}{5}\right) = -\frac{2}{3} + \frac{9}{25} = \frac{-23}{75}$$

$$f'(x) \Rightarrow y^2 = x - 1 \quad g(x) = f(x) + \sqrt{f(x)}$$

$$\Rightarrow f(x) =, x^2 = y - 1$$

$$y = x^2 + 1$$

$$\Rightarrow g(12) = f(x) + \sqrt{f(x)} = 12 \longrightarrow f(x) = 9 \Rightarrow f(x) = 9 = x^2 + 1 = \boxed{x=2}$$