

الف) $f = \{(2,2) (h,2) (2, h^2-h), (m,2) (-1,4)\}$

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$(2,2), (2, h^2-h) \Rightarrow h^2-h=2 \quad h^2-h-2=0$

$(m,2) = (2,2) \Rightarrow m=2$

$h=2$

$(h-2)(h+1) = \begin{cases} 2 \rightarrow h=2 \\ -1 \times \end{cases}$

$(-1,4) (-1,2)$

$\therefore f = \{(-1,4) (1,2) (2,2) (m,2) (2, h^2-h) (m,2)\}$

$(2,2) = (m,2) \Rightarrow m=2$

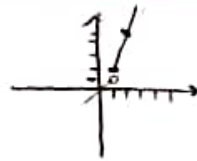
$(2,2) = (2, h^2-h) \Rightarrow h=2$

$(-1,4) = (2,2) \Rightarrow 2=4$

$(1,2) = (2,2) \Rightarrow h=2$

(۲)

$f(x) = \begin{cases} x-1 & x \geq 1 \\ x+1 & x < 1 \end{cases}$



$x+1 < 2 \Rightarrow x < 1$

(۲)

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$f(x) = \begin{cases} x-1 & x \geq 1 \\ x+1 & x < 1 \end{cases}$



$\begin{cases} x > 0 \rightarrow x-1 < 2 \rightarrow x < 3 \\ x = 0 \rightarrow -1 < 2 \\ x < 0 \rightarrow x+1 < 2 \rightarrow x < 1 \end{cases}$

(۲)

چون این که یک سیم است و در این مورد است

$x > 0 \rightarrow x-1 < 2 \rightarrow x < 3$

$0 \cap (2) \rightarrow x \in (0, 3)$

الف) $y = x^3 + 2$

$y-2 = x^3$

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

لامنتوی

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



ب) $y = x^2 - 2x + 2$

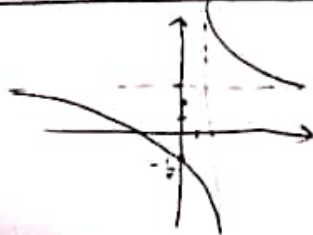
$\Delta = 14 - 4 = 10 \Rightarrow \Delta > 0$

(۲)

پس یک ریشه است (دارد ۲ ریشه یکنه)

الف) $y = \frac{x+1}{x-2}$

تابع هذلولیه
مکملی بدید



ب) $y = \frac{x+2}{x+1}$

$\frac{x+2}{x+1} = 2$

(۲)

تابع ثابت

پس یک ریشه یکنه

$x+1 = y(x-2)$

$x(2-y) = -1-y$

$x = \frac{-1-y}{2-y}$

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

الف) $y = \sqrt{x-2}$ یک یک به یک است ✓

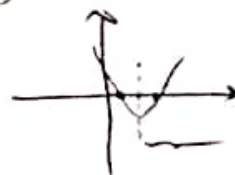


عکس

$y = \sqrt{x-2} \Rightarrow y^2 = x-2$
 $\Rightarrow x = y^2 + 2$ ✓

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

$x \in [2, +\infty)$ پس یک به یک است ✓



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

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

2

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

$f(x) = x + \sqrt{x} \Rightarrow x > 0$
 $y = x + \sqrt{x}$

$x = \frac{y^2 + 1 \pm \sqrt{(y^2 + 1)^2 - 4y^2}}{2}$

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

$(x+\sqrt{x}) \Rightarrow 0 + \sqrt{0} = 0$

$\Rightarrow a+b+c = 1+1-1 = 1$ ✓

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

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

$\Rightarrow y > 0 \Rightarrow y = \frac{y^2 + 1 - \sqrt{y^4 + 2y^2 + 1 - 4y^2}}{2} = a+b-\sqrt{c}$

$\Rightarrow a = \frac{1}{2}, b = \frac{1}{2}, c = \frac{1}{4}$

$y = \frac{x}{\sqrt{x^2-2}} \Rightarrow \left(\frac{x_1}{\sqrt{x_1^2-2}} - \frac{x_2}{\sqrt{x_2^2-2}}\right)^2 = \frac{x_1^2}{x_1^2-2} - \frac{x_2^2}{x_2^2-2}$ - 1

$x_1^2 x_2^2 - 2x_1^2 = x_1^2 x_2^2 - 2x_2^2 \Rightarrow 2x_1^2 = 2x_2^2 \Rightarrow x_1 = \pm x_2$ یک به یک نیست ✓

$x_1 = -x_2 \Rightarrow \frac{x_1}{\sqrt{x_1^2-2}} = \frac{x_2}{\sqrt{x_2^2-2}} \Rightarrow x_1 = x_2 \Rightarrow y = \frac{x_2^2}{x_2^2-2} \Rightarrow y = \frac{+12}{12-2}$ ✓

$f^{-1}(x) = \frac{x}{1+|x|}$

$g(x) = \sqrt{x} - 1$

$\frac{x}{1+|x|} = -\frac{1}{5}$

$\frac{dx}{dx} = -\frac{1}{5} \Rightarrow x < 0$

$f\left(-\frac{1}{5}\right) + g^{-1}\left(-\frac{1}{5}\right)$

$\sqrt{x} - 1 = -\frac{1}{5} \Rightarrow \sqrt{x} = \frac{4}{5}$ 2

$\sqrt{x} = -\frac{1}{5} \Rightarrow x = \frac{1}{25}$

$-\frac{1}{5} + \frac{9}{5} = \frac{8}{5} = \frac{16}{10} = \frac{4}{2.5} \Rightarrow g^{-1}\left(-\frac{1}{5}\right) = \frac{9}{5}$ ✓

$f^{-1}(x) = \sqrt[3]{x-1}$, $g(x) = f(x) + \sqrt{f(x)}$

$g^{-1}(12) = ? = 9$ 2

$f(x) + \sqrt{f(x)} = 12 \Rightarrow f(x) = 9$

$f^{-1}(9) = \sqrt[3]{9-1} = 2$