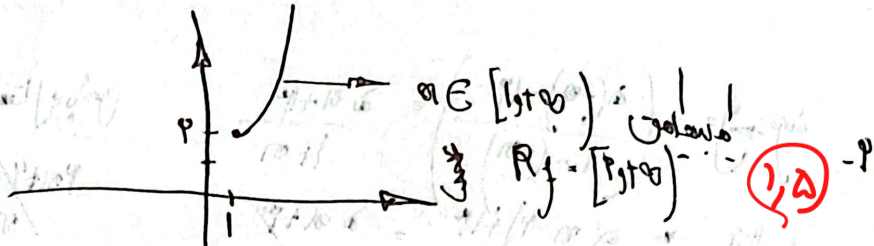


1K

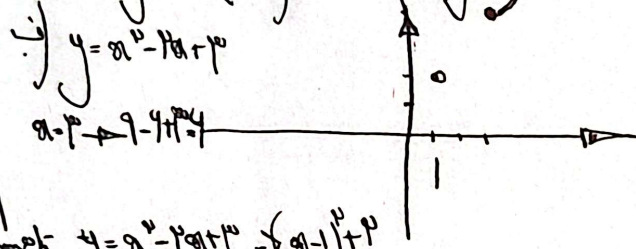
$\frac{a}{p} = \frac{y+p}{p} \Rightarrow \frac{y}{p} + \frac{p}{p} = \frac{y+p}{p}$
 $\delta = \frac{y}{p} + \frac{p}{p} = \frac{y+p}{p}$ ✓
 $a=0 \rightarrow \frac{y}{p} + \frac{p}{p} = 0 \Rightarrow \frac{y}{p} + 1 = 0 \Rightarrow \frac{y}{p} = -1 \Rightarrow y = -p$
 $y=0 \rightarrow \frac{y}{p} + \frac{p}{p} = 0 \Rightarrow \frac{y}{p} + 1 = 0 \Rightarrow \frac{y}{p} = -1 \Rightarrow y = -p$

لترتیب
(۲)

$y = a^p - p a + p$
 $a_{min} = -\frac{b}{p a} = \frac{p}{p} = 1$
 $y_{min} = 1 - p + p = p$

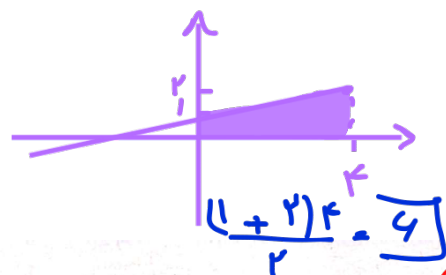


$y = a^p - p a + p = (a-1)^p + p$
 $y - p = (a-1)^p \Rightarrow \pm \sqrt[p]{y-p+1} = a \rightarrow y = 1 \pm \sqrt[p]{a-p}$



$y = a^p - p a + p = (a-1)^p + p$

$\sqrt[p]{y-p} + 1 = a \rightarrow y = 1 \pm \sqrt[p]{a-p} \Rightarrow y = 1 \pm \sqrt[p]{a-p}, a \in [p, \infty)$ ✓
 (نقص)



$$f(x) = 1 + x^2 = \sqrt{1 + x^2} = \sqrt{1 + x^2} = \sqrt{1 + x^2} = \sqrt{1 + x^2}$$

$$x \rightarrow 1 \rightarrow 1 + 1 = 2 = f$$

$$x \rightarrow 0 \rightarrow 1 + 0 = 1 = f \rightarrow f(x) = 1 + x^2$$

$$f^{-1}(x) = \frac{x}{2} + 1 \quad D = (-\infty, 4]$$

$$x = 0 \rightarrow f = 1 \quad x = 1 \rightarrow f = 2$$

المنطقة

1, \sqrt{2}

علامات

$$y = x \rightarrow x = y$$

$$x = 1 \rightarrow y = 2 \quad x = 0 \rightarrow y = 1$$

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

$$f^{-1}(x) = \frac{x}{2} + 1$$

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

منطقة

منطقة علامته

$$\begin{aligned}
 & \begin{array}{l}
 \frac{a^p - \varepsilon a + k}{-a^p + 4a + 4k} \cdot \frac{a/p}{g_{\text{po}}} \cdot \frac{-b/p}{p_a} = 1 \\
 \Rightarrow \frac{a^p - \varepsilon a + k}{-a^p + 4a + 4k} \cdot \frac{a/p}{g_{\text{po}}} \cdot \frac{-b/p}{p_a} = 1
 \end{array}
 \Rightarrow \begin{array}{l}
 a = p \rightarrow k - \varepsilon = \varepsilon - 1 + k \\
 a = p \rightarrow 1 + 4a = -1\varepsilon + 1p + 4k
 \end{array}
 \end{aligned}$$

2

$$\Rightarrow 1 + 4k \ll k + \varepsilon \Rightarrow \frac{1}{4}k \ll -1p \Rightarrow k \ll -4 \quad \checkmark$$

$$f(\eta) = p\eta + |\eta|$$

$$\eta \begin{matrix} \nearrow \\ \searrow \end{matrix} \begin{matrix} 0 \\ 0 \end{matrix} = \begin{matrix} f \\ p \end{matrix} \eta$$

$$\Rightarrow f^{-1}(\eta) \begin{matrix} \nearrow \\ \searrow \end{matrix} \begin{matrix} \eta/p \\ \eta/0 \end{matrix}$$

$$a\eta + b|\eta| \rightarrow \eta \begin{matrix} \nearrow \\ \searrow \end{matrix} \begin{matrix} 0 \\ 0 \end{matrix} \Rightarrow a\eta + b\eta = (a+b)\eta = \eta/p \Rightarrow a+b = 1/p$$

$$1 \rightarrow \eta \begin{matrix} \nearrow \\ \searrow \end{matrix} \begin{matrix} 0 \\ 0 \end{matrix} \Rightarrow a\eta - b\eta \Rightarrow a-b = 1/p$$

$$\Rightarrow ab = +\frac{1}{p}a - \frac{1}{p} = -\frac{1}{4p} \quad \checkmark$$

$$\Rightarrow a = \left(\frac{1}{p} + \frac{1}{p}\right) \frac{1}{p} = \frac{2}{p^2}$$

$$b = \left(\frac{1}{p} - \frac{1}{p}\right) \frac{1}{p} = -\frac{1}{p^2}$$

2 -9

$$f(x) = \frac{px+q}{x+m} \rightarrow x=p \rightarrow \frac{p+q}{p+m} = -1 \Rightarrow m=-p \rightarrow f(x) = \frac{px+q}{x-p}$$

(1, V) -2

$$f^{-1}(x) = \frac{px+q}{x-p}$$

$$f \circ f^{-1}(x) = \frac{p \left(\frac{px+q}{x-p} \right) + q}{\frac{px+q}{x-p} - p} = \frac{p(px+q) + q(x-p)}{px+q - p(x-p)} = \frac{p^2x + pq + qx - qp}{px+q - px + p^2} = \frac{p^2x + qx}{p^2 + q} = x \Rightarrow y = \frac{px+q}{x-p}$$

دقت!

$$\frac{px+q}{x-p} + x = x \Rightarrow \frac{px+q}{x-p} = 0 \Rightarrow x = -\frac{q}{p}$$

$$f(r, r) = t \xrightarrow[\text{از دو طرف}]{f^{-1}} r, r = f^{-1}(t) \rightarrow u = \frac{r - f^{-1}(t)}{r}$$

$$g(\frac{r}{r}) = r - t \xrightarrow[\text{از دو طرف}]{g^{-1}} \frac{u}{r} = g^{-1}(r - t) \rightarrow u = r g^{-1}(r - t)$$

$$\frac{r - f^{-1}(t)}{r} = r g^{-1}(r - t) \xrightarrow{t = -r} r - f^{-1}(-r) = r g^{-1}(r) \xrightarrow{\text{جواب}} \boxed{r}$$

$$f(r - p) = r$$

$$r - g(\frac{r}{p}) = r$$

$$f^{-1}(r) = r - p$$

$$g(\frac{r}{p}) = -p$$

$$g^{-1}(-p) = \frac{r}{p}$$

$$\Rightarrow r - p + \frac{r}{p} = r - p + \frac{r}{p} = \frac{r - pr + r}{p}$$

$$y = - \left(\frac{a(-a) - 13}{1 - (-a)} \right) = \frac{a^2 + 13}{1 + a}$$

$$\text{انتقال به یکنواخت} \rightarrow \frac{a(a - p) + 13}{1 + (a - p)} = \frac{a^2 + p a + 13}{1 + a - p}$$

$$y = \frac{a^2 + p a + 13}{1 + a - p}$$

$$y + f(y) = a$$

$$y = a + f(y)$$

$$\text{انتقال به یکنواخت} = \frac{a^2 + p a + 13}{1 + a - p} = \frac{a^2 + p a + 13}{1 + a - p}$$

$$\frac{p a + 13}{1 + a - p} = a$$

$$a^2 - a = p a + 13 \Rightarrow a^2 - p a + 13 = 0$$

برای طرول کردن متوجه!

قدیمه نمودار نسبت به $y = u$ همان طرول تابع است

$$y = u + f[u]$$

از دو طرف
برای تبدیل

$$[y] = [u] + f[u] = a[u] \rightarrow [u] = \frac{[y]}{a}$$

$$y = u + f \frac{[y]}{a} \rightarrow u = y - f \frac{[y]}{a} \xrightarrow{\text{طرول}} y = u - \frac{f[u]}{a}$$

$$(f - g)(u) = u + f[u] - u + \frac{f}{a}[u] = \boxed{f, \frac{f}{a}[u]}$$