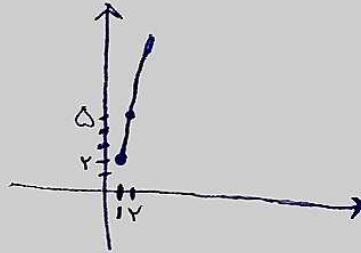


الف) $f = \{(-1, 4), (2, m), (h, n^2 - h), (3, 2), (h, 5)\}$

ب) $f = \{(-1, 4), (2, 3), (a, m-1), (a+2, h), (m, 3)\}$

$h^2 - n^2 = 2$
 $h^2 - n^2 = 20$
 $a + c = b \rightarrow -1 + \frac{c}{a} \rightarrow 2 \rightarrow h^2 - 1 \rightarrow$ (منوجه است)
 $(-1, 4)$ و $(1, 5)$ نقطه ها
 $a^2 - 1 \leftarrow (-1, 4) \text{ و } (a, 1)$ $(1, 2) \text{ و } (1, h) \rightarrow h^2 = 2$

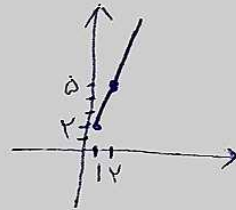
$f(x) = \begin{cases} 3x-1; & x \geq 1 \\ x+a; & x < 1 \end{cases}$



$x \geq 1 \rightarrow 1+a \leq 2$
 $a \leq 1$

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

$x \geq 0 \rightarrow a-1 < 2$
 $a < 3$



الف) $y = 2x^2 + 2 \rightarrow$ $\rightarrow$ $y = 2x^2 + 2 \rightarrow x = 2, y = 10$
 $\sqrt{2x-2} = y$

ب) $y = 2x^2 - 4x + 2$
 $-\frac{b}{2a} \rightarrow \frac{4}{4} = 1$
 $y \leq 0 \rightarrow 2x^2 - 4x + 2 \leq 0$
 $x^2 - 2x + 1 \leq 0$
 $(x-1)^2 \leq 0$
 $x = 1$

الف) $y = \frac{3x+1}{x-2}$
 $\rightarrow$ $y = \frac{3x+1}{x-2}$
 $\rightarrow x = \frac{(-2y-1)(-1)}{y-3}$

ب) $y = \frac{4+2x}{x+2}$
 $\rightarrow \frac{2(2+x)}{x+2} \rightarrow y = 2, x \neq -2$
 $\rightarrow$ $\rightarrow$ $\frac{2y+1}{y-3}$

برداران ۲ به ۲

الف) $y = \sqrt{x-3}$ $(x, y) \in f$ $\rightarrow y^2 = x-3 \rightarrow x = y^2+3$

$f^{-1}(y) = y^2+3$ $\rightarrow x = y^2+3$

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

$\rightarrow -\frac{b}{2a} = \frac{4}{2} = 2$

$x^2+3=y \rightarrow x^2-y+3=0$

$x^2-y^2-4y+3=0$

$(x) = x\sqrt{x} \rightarrow y = x\sqrt{x}$

$\rightarrow x = y\sqrt{y} \rightarrow y\sqrt{y} = x \rightarrow y^{\frac{3}{2}} = x \rightarrow y = x^{\frac{2}{3}}$

$f^{-1}(x) = x^{\frac{2}{3}}$

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

$x = \sqrt{y^2+2}$

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

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

$\rightarrow y\sqrt{x^2-2} = x$

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

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

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

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

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

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

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

$\rightarrow y = \frac{x}{1+x}$

$y(1+x) = x$

$y + yx = x$

$y = x - yx$

$y = x(1-y)$

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

$y(1-y) = x$

$y - y^2 = x$

$y^2 - y + x = 0$

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

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

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

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

$f^{-1}(y) = y^2+1$

$g(y) = \sqrt{x} + \sqrt{y}$

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

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

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

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

$y^2 + y = x + 2y\sqrt{y}$

$y^2 + y = 12$

$y^2 + y - 12 = 0$

$(y+4)(y-3) = 0$

$y = -4$ or $y = 3$

$f^{-1}(12) = 3$

$A + \sqrt{A^2+1} = 11$

$\sqrt{A^2+1} = 11-A$

$A^2+1 = (11-A)^2$

$A^2+1 = 121 - 22A + A^2$

$1 = 121 - 22A$

$22A = 120$

$A = \frac{120}{22} = \frac{60}{11}$